GUADALUPE RIVER
Planning Study

consisting of
the

Final Engineer's Report

february 1978

Santa Clara Valley Water District

5, 394-1

Santa Clara Valley Water District

5750 ALMADEN EXPRESSWAY
SAN JOSE, CALIFORNIA 95118
TELEPHONE (408) 265-2600

February 21, 1978

The Honorable Board of Directors
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Board Members:

Transmitted herewith is the Engineer's Report on Proposed Flood Control Measures on the Guadalupe River, Project Number 3015, from the Southern Pacific Railroad in Alviso to Trimble Road. This project is within the City of San Jose, the City of Santa Clara, and the County of Santa Clara in the Central Flood Control Zone of the Santa Clara Valley Water District.

This report describes the proposed flood prevention works consisting of levee raising, channel widening, and channel slope protection. The proposed project will be aligned along the existing river, a distance of approximately 22,000 feet. The estimated cost of the proposed work is $3,000,000 based upon January 1978 prices.

The proposed project will provide protection from flooding to the floodplain area west of the Guadalupe River between Southern Pacific Railroad and Trimble Road. This area contains approximately 250 acres of residential development, 100 acres of commercial-industrial property, and about 350 acres of open space property which includes a public golf course, Agnews State Hospital and the City of Santa Clara's east side retention basin.

The proposed project will not completely prevent flooding to the floodplain area east of Guadalupe River between Southern Pacific Railroad and Trimble Road. Water could still break out of Guadalupe River between State Route 17 and Curtner Avenue and flow overland to the Alviso area. The Army Corps of Engineers is studying these other sections of the Guadalupe River with the hope of correcting the flood control deficiency in future years. The Corps of Engineers will not include the work proposed in this report as part of their Guadalupe River study. This work is considered a "local responsibility" in order to allow the Corps to concentrate their efforts and resources on more critical portions of the river. A Negative Declatation for the proposed project was approved on December 7, 1976.

AN AFFIRMATIVE ACTION EMPLOYER

I concur in the project, as proposed, and recommend that a public hearing be held as a prerequisite to the construction of the project.

Sincerely yours,

John T. O'Halloran

John T. O'Halloran
General Manager

Enclosure

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PREFACE

This is a report on the proposed flood control project on Guadalupe River from SPRR to Trimble Road in the Cities of Santa Clara and San Jose and unincorporated areas of Santa Clara County.

This report describes the flooding problem and discusses various alternatives to alleviate the problem and presents estimated costs and impacts of these alternatives. The report includes the description of the proposed project and discusses the cost, benefits, and financing of the project.

The proposed project was recommended by the District staff after they considered the concerns of federal, local, and state agencies including: The U.S. Fish and Wildlife Service, the California Department of Fish and Game, U.S. Army Corps of Engineers, and the California Regional Water Quality Control Board.

This report will be circulated to interested parties and filed in a public place for review. After the review period, the District Board of Directors will receive comments on the report and the proposed project at a public hearing. The Board has set March 14, 1978 as the date for the public hearing. At this Public Hearing, the Board will either approve or disapprove the project. If the project is approved, final design of the recommended improvements will begin soon after, and construction is expected to begin in the spring of 1978.

If you have any comments or questions about the study or this report, please contact the person or persons listed in Appendix A.

SUMMARY

Storm runoff from the Guadalupe River watershed presents one of the greatest potentials for disastrous flood damages in Santa Clara County. The U. S. Army Corps of Engineers has concluded that "...the magnitude of flooding in the study area is probably the highest of anywhere within the San Francisco Metropolitan Area...." The April 1958 flood on the Guadalupe River caused $1,348,000 in damages to the San Jose and Alviso areas.

Several alternative concepts for flood prevention were evaluated as part of this study and previous studies. Five specific alternatives for channel modifications in the study reach were reviewed in detail. The alternative which produced the greatest benefits and the least environmental damage at the lowest cost is proposed for construction.

The proposed project consists of enlarging the levees between SPRR and Montague Expressway and the construction of a widened channel from Montague Expressway to Trimble Road. The proposed levees will be as much as seven feet higher than the existing levees. The excavation between Trimble Road and Montague Expressway will widen the river approximately 150 feet and the excavated material will be used for levee construction between SPRR and Trimble Road.

The estimated cost for the proposed project is $3,000,000 which includes: construction, engineering, inspection, and the cost to acquire approximately 33 acres of additonal right of way. The estimated construction cost $1,500,000.

Financing for the proposed project would be derived from the ad valorem tax in the Central Flood Control Zone.

The proposed project has been analyzed by the District's Environmental Specialist, Dr. Bernard Goldner. Dr. Goldner has determined that the proposed project will not have a significant adverse impact on the environment. A copy of the Negative Declaration that was approved by the District's Board of Directors is attached to this report as Appendix B.

INTRODUCTION

This report presents a discussion of the proposed flood control project for the Guadalupe River in the reach from Southern Pacific Railroad (SPRR) in Alviso to Trimble Road in Santa Clara County.

Purpose of Project

This project, in conjunction with other future projects upstream and downstream of this reach, will provide protection from flooding of adjacent lands during the occurrence of the 1% flood. The proposed project will provide protection from flooding to the floodplain area west of the Guadalupe River between Southern Pacific Railroad and Trimble Road. This area contains approximately 250 acres of residential development, 100 acres of commerical-industrial property, and about 350 acres of open space property which includes a public golf course, Agnews State Hospital and the City of Santa Clara's east side retention basin. However, the proposed project alone will not completely prevent flooding of the floodplain area east of Guadalupe River between the Southern Pacific Railroad and Trimble Road. Water could still break out of Guadalupe River between State Route 17 and Curtner Avenue and run overland to the Alviso area. The Army Corps of Engineers is studying Guadalupe River between State Route 17 and Curtner Avenue.

The purpose of this proposed project is to complete flood control improvements on the only remaining deficient section of Guadalupe River between San Francisco Bay and Curtner Avenue, that is not being studied by the Army Corps of Engineers.

However, some minor erosion repair work will still have to be done in future years between State Route 17 and Trimble Road.

Scope of Report

This report presents a description of the flooding problem, the alternative solutions investigated, including estimated costs, and a discussion of the recommended project, its structural elements, costs, and financing.

Previous Reports

Several previous reports on the flood problems of the Guadalupe River and possible methods of flood prevention have been prepared by various agencies. These range from early preliminary reports by county government to recent studies by federal agencies concerned with flood control.

In September, 1944, the Engineering Department of the County of Santa Clara issued the "Preliminary Report on the Guadalupe Creek and Tributaries, Santa Clara County, for Flood Control and Runoff". This report presented rainfall and runoff data collected to that time as well as a topographic map showing flood prone areas and recommendations for channel improvements on the Guadalupe River.

In August, 1960, the Santa Clara County Flood Control and Water Conservation District issued the "Engineers Report of Proposed Improvements for Zone C-1, the Central Zone". This report presented a specific program for flood control improvements on Los Gatos Creek from its confluence with the Guadalupe River upstream to Saratoga Avenue in Los Gatos and on the Guadalupe

River from Coyote Creek (at the bay) upstream to Branham Lane. Engineering design, financing, and construction staging for these projects were outlined in detail. The details of these plans and their subsequent implementation on the Guadalupe River will be discussed in a later section of this report.

In September, 1968, the County of Santa Clara, Department of Public Works, issued a report entitled "Preliminary Drainage Report". This report addressed the problem of using a comprehensive approach to solve the drainage and flood control problems of the county. It stressed the need to improve the Guadalupe River and Coyote Creek in their lower reaches to solve the problems of subsidence, siltation, and the encroachment of development on the floodplain without adequate local drainage.

In January, 1972, the U. S. Army Corps of Engineers issued a "Floodplain Information Study for the Guadalupe River from Coyote Creek to Blossom Hill Road". This study discussed in detail the hydrology of the watershed, historic flooding and floodflows, and potential future flooding. It presented detailed water surface profiles for floods of various frequencies and maps which delineated the limits of flooding for these floods. No recommendations were made for flood control improvements.

A report prepared by Dr. Andrew H. Trice in April, 1974, entitled "Report on Potential Flood Damages on Guadalupe River, Coyote Creek, and Adjacent Streams", presents very detailed estimates of the potential flood damages and inundated areas for the

Guadalupe River. This report was prepared for the U. S. Army Corps of Engineers in cooperation with the Santa Clara Valley Water District. The information presented in Dr. Trice's report will be referred to in later sections of this report.

Related Projects

The reach of the Guadalupe River addressed in this report is only one portion of the river which is presently not adequate to convey the design flood. The U. S. Army Corps of Engineers is conducting a study of the flood control needs of the entire Guadalupe River. Their emphasis is being placed on two principal reaches; (1) Alviso Slough downstream of SPRR and (2) the reach from State Route 17 to Curtner Avenue. These are the inadequate reaches which are not scheduled for improvement prior to 1980 by the Santa Clara Valley Water District. The Corp's study plan indicates that if a Federal project is justified, construction would commence after 1980.

The reach of channel from Trimble Road to State Route 17 is adequate to convey the Corps' design flood and is not scheduled for construction by the District or by the Corps.

DESCRIPTION OF THE PROBLEM

This section of this report discusses the location of the flood problem, a description of the watershed and the river, historic flooding, the limits of flooding during the design flood, and potential damages for the Guadalupe River.

Location of the Problem

The proposed flood control project is located in the northern portion of Santa Clara County near the community of Alviso. The proposed project limits are SPRR on the north and Trimble Road on the south. Portions of the project lie within the City of San Jose, the City of Santa Clara, and the County of Santa Clara. The specific details of the proposed construction will be discussed in a later section. Figure 1, on page 6 shows the general location of the proposed project and the tributary watershed. Figure 2, on page 7 shows the specific project location.

Description of Watershed and River Channel

The Guadalupe River begins at the confluence of Guadalupe Creek and Alamitos Creek in the Almaden Valley, but its tributaries rise in the Santa Cruz mountains to the south and west. All of the watershed is within the boundaries of Santa Clara County. Watershed elevations range from slightly below sea level to about 3500 feet above sea level. Three reservoirs in the upper basin, Calero, Almaden and Guadalupe, have a combined capacity of

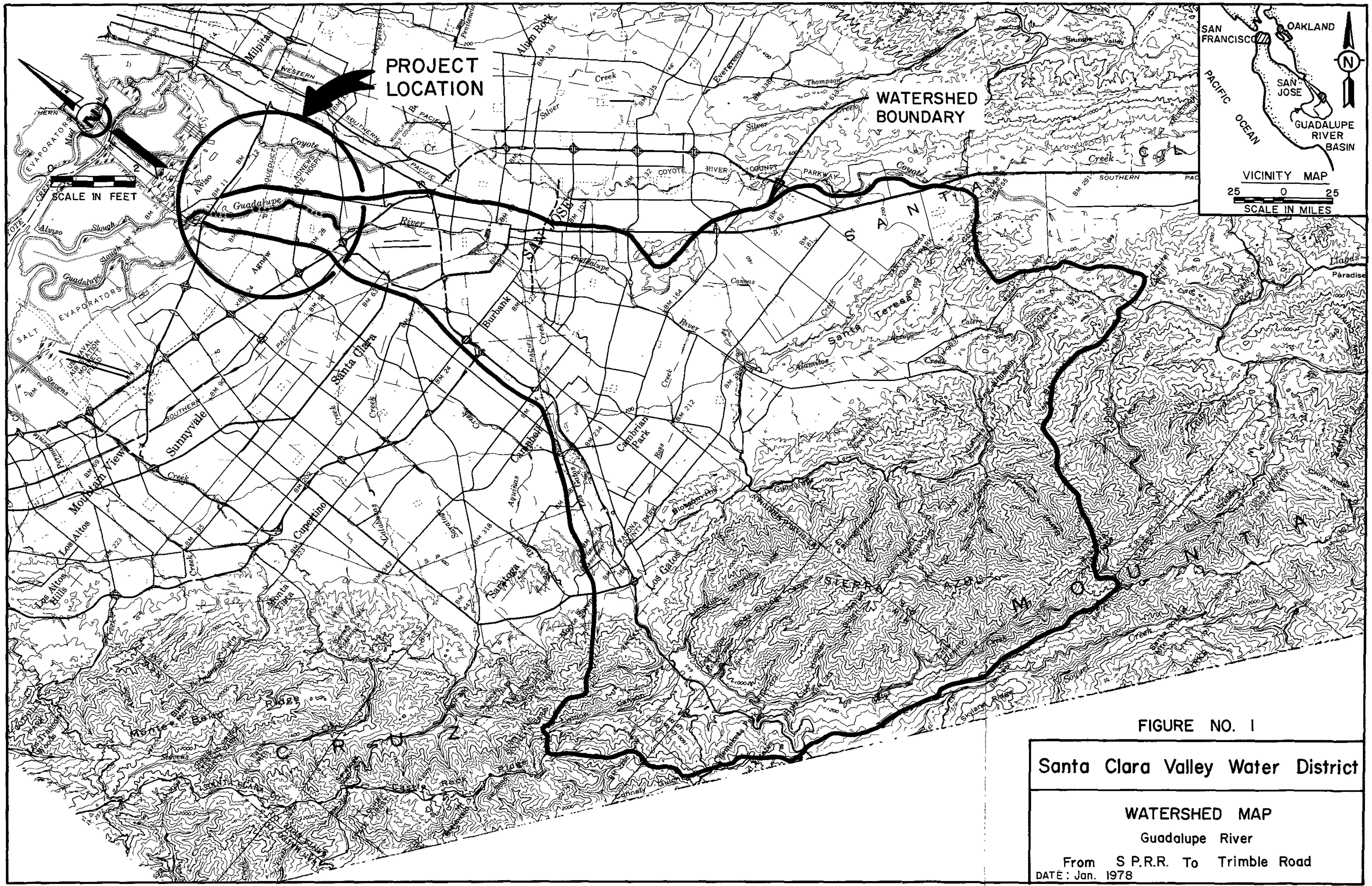

FIGURE NO. 1

Santa Clara Valley Water District

WATERSHED MAP

Guadalupe River

From S.P.R.R. To Trimble Road

DATE: Jan. 1978

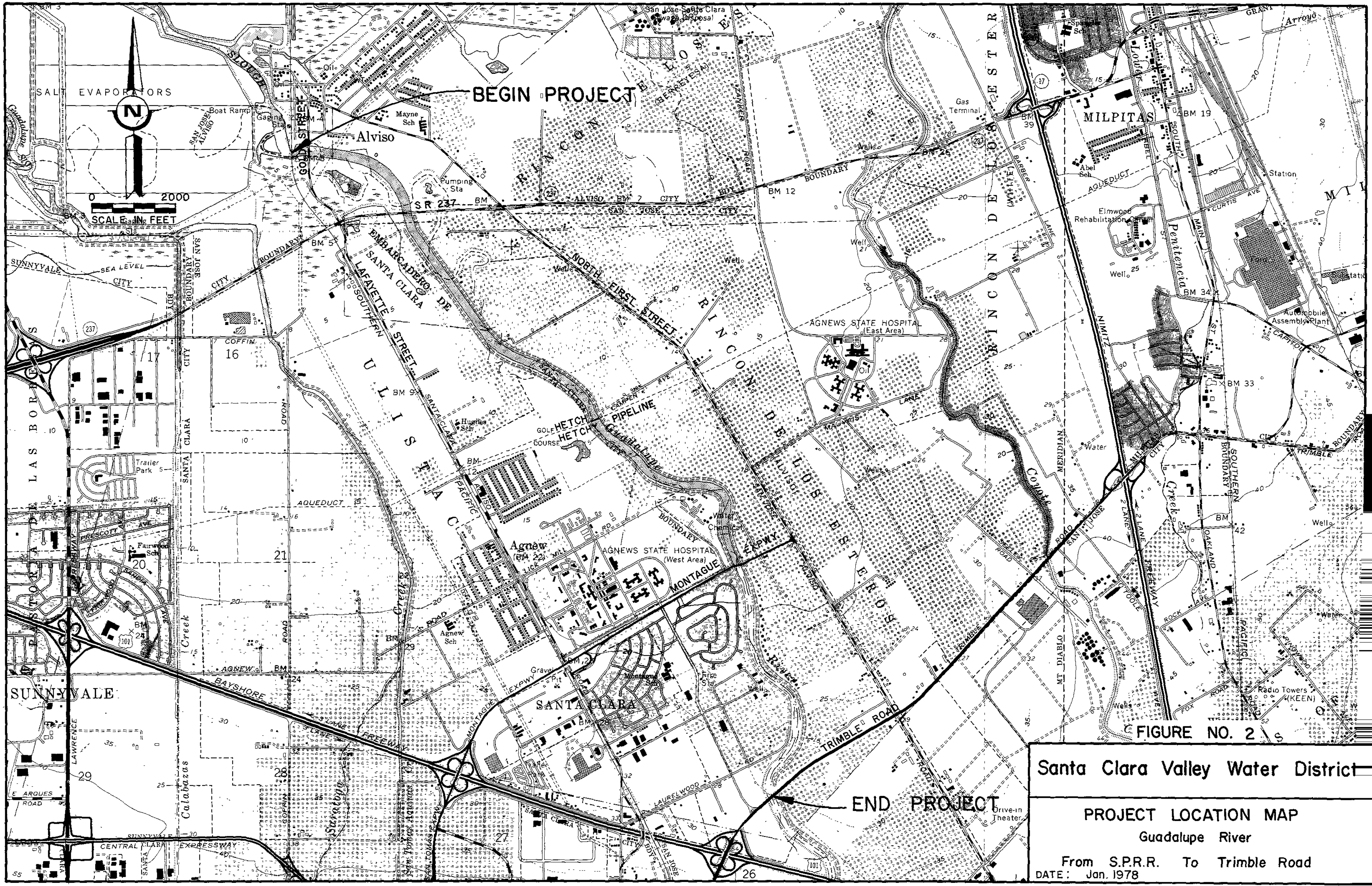

FIGURE NO. 2

Santa Clara Valley Water District

PROJECT LOCATION MAP

Guadalupe River

From S.P.R.R. To Trimble Road

DATE: Jan. 1978

15,680 acre-feet and contribute somewhat to the regulation of peak flows within the basin system. Additional regulation is derived from almost 27,000 acre-feet of reservoir storage on Los Gatos Creek. The Guadalupe River flows generally north westward through the City of San Jose and the community of Alviso and outfalls into Coyote Creek about one and one-half miles east of the mouth of Coyote Creek at the San Francisco Bay. The watershed area is bounded by the Coyote Creek basin on the east, the Santa Cruz mountains on the south, the San Tomas - Saratoga Creek basin on the west and San Francisco Bay to the north.

The area has a relatively mild climate; temperatures range from the average high of 81 degrees during July to an average low of 49 degrees in January. Ninety percent of the rainfall occurs in the late fall and winter months. January is usually the month with the most rainfall. Although thunderstorms do occur during the summer months, they do not contribute significantly to the annual precipitation. The mean annual precipitation of the basin varies from a high of 68 inches in the Santa Cruz mountains above Almaden Reservoir to a low of 15 inches in San Jose. The basinwide average rainfall is 36.5 inches.

The upland mountainous drainage area of Guadalupe River has soils developed on sedimentary rocks, basic igneous rocks and serpentine rocks. The main soils are of the Los Gatos, Gaviota, Vallecitos and Haymen Association. They range in depth from shallow to deep and are located on steep to very steep slopes with good drainage. The vegetative cover includes grasses, oak, pine, brush and hardwood. The upland soils have been classified to have high to very high erosion potential although the sediment deposition rates in the upstream reservoirs have not been high in the past. This is probably explained by the present land use which does not disturb the native cover. The infiltration rate of water into these upland areas is classified as very slow.

The soils in the lowland valley and foothill areas are of the Arbuckle, Zamora, Pleasanton Association having depths varying from shallow to moderately deep. In general, the soils are the type that drain relatively well. The lowland soils are classified as having none to slight erosion potential and have a moderate water infiltration rate. Some erosion has occurred in the stream channels and banks during periods of high runoff.

The upland portion of the watershed has very little development at this time and the County "General Plan" calls for only nominal development in the future with mostly open space. The valley floor which has been actively developed the past 15 years includes subdivisions, shopping centers, and light industries and has the potential for additional urban development to cover the entire area.

The watershed characteristics discussed in this section i.e., soil type, urban development, existing and potential reservoir storage, together with the general hydrology of the area have been considered in developing the design flood flows for the proposed flood control measures described in this report.

The valley floor area immediately adjacent to the proposed project reach is presently being used predominantly for agricultural purposes. As can be seen by recent developments in the area, the land use is slowly changing to more intensive uses such as residential, commercial, and industrial. Figure 3, on page 11 shows the present land uses in the areas adjacent to the project reach.

Previous Construction

The existing river channel in this reach is not the original natural channel. In 1963, the natural channel was replaced with the existing channel as the first phase of the improvement projects outlined in the "Engineer's Report of Proposed Improvements for Zone C-1, The Central Zone" by the Santa Clara County Flood Control and Water Conservation District, dated 1960. That project was designed to provide sufficient capacity to convey a peak flood discharge of 12,000 cubic feet per second (cfs) which is approximately equivalent to a 15-year flood based on the Santa Clara Valley Water District's present hydrology methods. The second phase of that project was to consist of channel excavation to provide the capacity to convey a peak flood flow of 25,000 cfs. The channel constructed in 1963 was generally a trapezoidal cross-section with benches between the main channel and the constructed levees. The bottom width of the channel was 80 feet with side slopes of 4:1 (4 horizontal to 1 vertical). During the 12 year period since construction of that channel considerable sloughing,

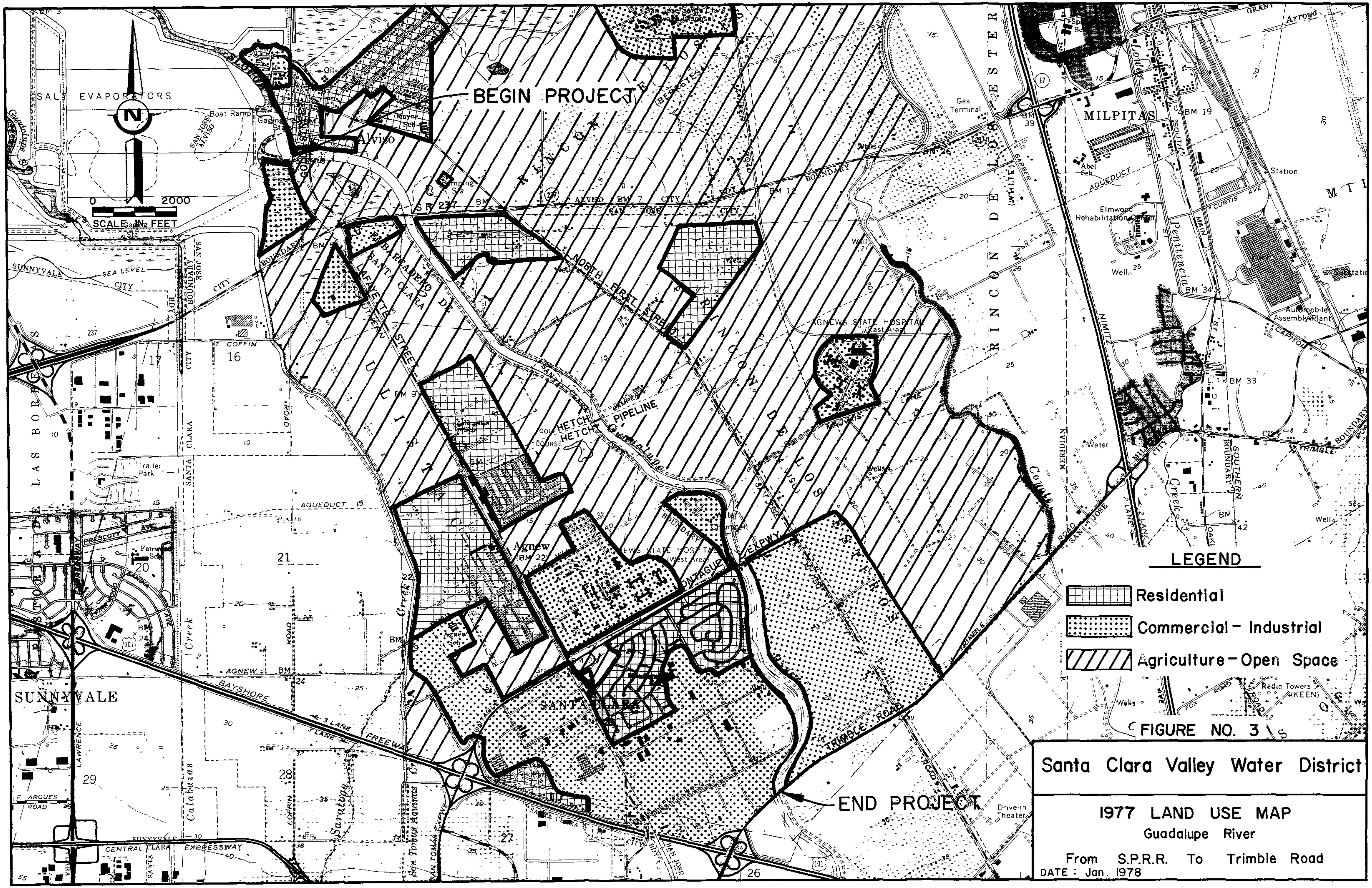

FIGURE NO. 3

Santa Clara Valley Water District

1977 LAND USE MAP

Guadalupe River

From S.P.R.R. To Trimble Road

DATE : Jan. 1978

sedimentation, and erosion have occurred which has resulted in a channel section more nearly parabolic than trapezoidal. The channel is about 18 feet deep in most places and ranges in top width from approximately 340 feet at Gold Street to 220 feet at Trimble Road. The channel banks and bottom are covered, in varying degrees, with several different vegetation types ranging from the typical marsh vegetation in the lower reaches to willow and cattail growths in the upper reach.

Historic Flooding

The Alviso area and the agricultural lands in this area have been subjected to many floods since their original settlement late in the eighteenth century. Recent flooding has been well documented by various government agencies and in newspaper articles. Previous flood control work on the Guadalupe River and in the upstream watershed has reduced the frequency of flooding.

The first recorded flood on the Guadalupe River occurred in 1778. This flood damaged the first town on the banks of the Guadalupe, built in 1777 by Lieutenant Jose Moraga. In 1784, a flood destroyed a mission built by the Spanish Fathers in 1777 as the eighth mission in the statewide chain. Since that time numerous floods have occurred in the same area. At least eleven floods occurred in the period from 1932 to 1963 along this reach of the river.

The largest recent flood occurred in April, 1958. This flood was the culmination of an extremely wet period during February and March, followed by very intense rainfall on the

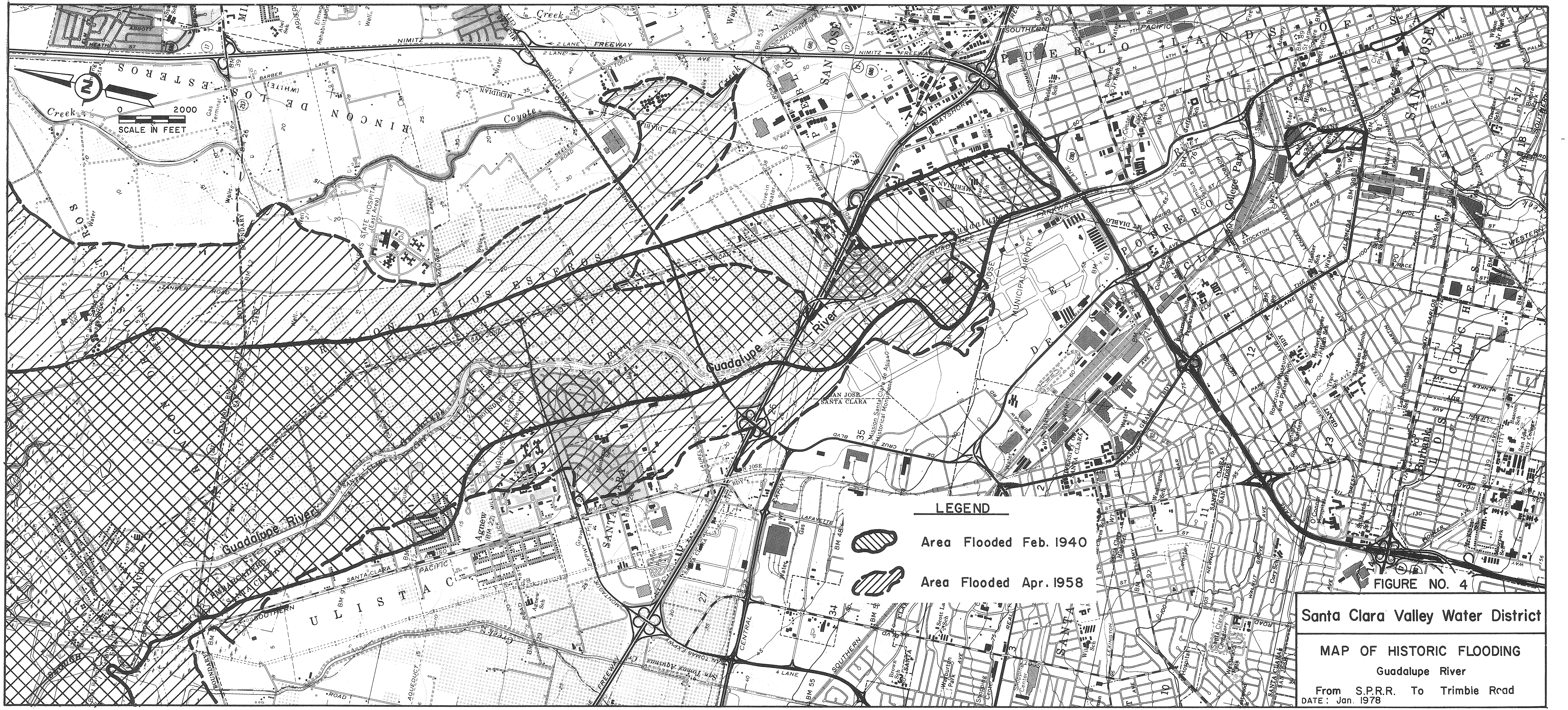

FIGURE NO. 4

Santa Clara Valley Water District

MAP OF HISTORIC FLOODING
Guadalupe River
From S.P.R.R. To Trimble Road
DATE: Jan. 1978

first and second of April. Approximately six inches of rain fell in this two-day period at Los Gatos. As a result, flooding occurred in San Jose inundating a two-block area and depths of flooding ranged up to about four feet. Additional flooding occurred at different points along the lower reaches of the stream to Alviso. Major sources of damage were in the basin's agricultural section and in Alviso. About 2,700 acres of agricultural land, mostly pear orchards, were flooded and all of Alviso was inundated 17 days. Inundation caused extensive damage to industrial, commercial, and residential property.

Although the April 1958 flood discharges were the largest recorded on the Guadalupe River, the rainstorm associated with the December 1955 floods, was much greater. The controls exercised by regulating the water conservation reservoirs in the upstream watershed greatly reduced the damages which could have occurred. During the period of December 15-28, 1955, approximately 23 inches of rain fell at Los Gatos. Of this total, 8.5 inches fell in one day, December 23. The resulting peak discharge, however, was only 5,570 cfs on the Guadalupe River, substantially less than what was produced by six inches in two days in 1958 (9,150 cfs). The total acreage inundated by the river during the 1955 flood was 5,050 acres between Brokaw Road and Alviso. The most concentrated losses were suffered within the City of Alviso, where practically the entire town was under water at depths up to five feet. There were 21 commercial establishments, 6 industrial plants, and 171 inundated, with services discontinued for periods varying from varying from several days to more than a month.

TABLE 1
HISTORIC FLOOD FLOWS

GUADALUPE RIVER [1]

Water Year	Date	Peak Discharge (cfs)
1932	12/27/31	6,700
1937	2/13/37	6,070
1938	12/11/37	6,660
1940	2/27/40	8,680
1941	4/4/41	6,330
1943	1/23/43	6,350
1945	2/4/45	6,600
1952	1/12/52	8,000
1956	12/23/55	5,570
1958	4/2/58	9,150
1963	1/31/63	6,300
1967	3/6/67	6,760
1968	1/30/68	5,170

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[1] Peak flows recorded at U.S.G.S. Stream Gaging Station on right bank 100 feet downstream of Los Gatos Creek, established in 1930.

TABLE 2
HISTORIC FLOOD DAMAGES [1]

GUADALUPE RIVER

Flood Damage Category	Damages ($1000) [2] Dec. 1955	 April 1958	 Jan. 1963
Agricultural	$246.6	192.0	[3]
Residential	56.0	217.0	20.3
Commercial	183.0	625.0	[3]
Industrial	126.2	22.0	[3]
Public Facilities	141.7	292.0	[3]
TOTAL	$753.5	$1,348.0	$295.0

[1] Flood damage data obtained from U.S. Army Corps of Engineers' Flood Reports for listed years.

[2] The damages are for the entire river from its mouth to Blossom Hill Road, but they do not include the damages on the tributaries.

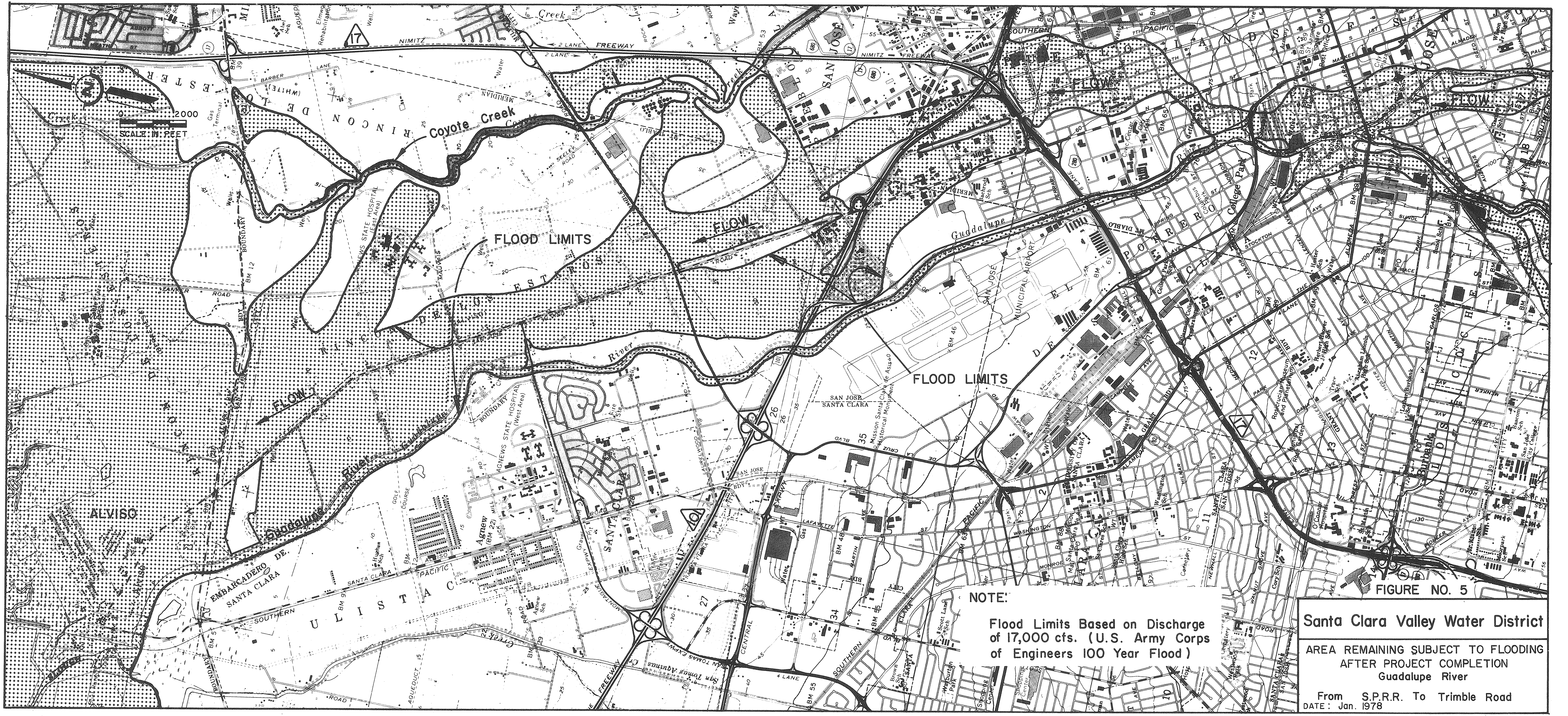
[3] A further breakdown of 1963 damages was not available.

Another major flood occurred in February, 1940, as a result of 7.27 inches of rain in a two day period at Los Gatos. The peak discharge resulting from this storm was 8,680 cfs. This rainfall followed a period of 4 days of relatively heavy rainfall and a January rainfall of 20.8 inches in the mountains. Approximately 3200 acres of agricultural land and the community of Alviso were flooded by runoff from this storm conveyed by the Guadalupe River.

Figure 4 on page 14 shows the limits of flooding attributable to the Guadalupe River during the floods of 1940 and 1958. Table 1 on page 15 lists the largest peak flood flows which have occurred in the river since the establishment of the streamgaging station downstream of the confluence of Los Gatos Creek and the Guadalupe River in San Jose. Table 2 on page 16 lists the flood damages by category as they were reported by the Corps of Engineers in their flood reports for the 1955, 1958, and 1963 floods.

Design Flood

The proposed flood control project, which will be described in detail in a later section, has been designed to convey a "1% flood" with standard freeboard. The "1% flood", also referred to as the "100 year flood", is the largest peak discharge in the river which could be expected to be equalled or exceeded on an average of once in one hundred years over a long period of time. It is the peak discharge which has a one percent chance of being equalled or exceeded in any one year. For the Guadalupe River below its confluence with Los Gatos Creek, the 1% flood has been



NOTE:

Flood Limits Based on Discharge of 17,000 cfs. (U.S. Army Corps of Engineers 100 Year Flood)

FIGURE NO. 5

Santa Clara Valley Water District

AREA REMAINING SUBJECT TO FLOODING AFTER PROJECT COMPLETION

Guadalupe River

From S.P.R.R. To Trimble Road

DATE: Jan. 1978

calculated to be 22,000 cfs (cubic feet per second). This flood would be more than one and one-half times greater than the largest flood observed on this river in the last 40 years. For a more complete description of the 1% flood and the determination of its magnitude, turn to Appendix C.

No study has been conducted to establish the precise limits of flooding for the design flood in the vicinity of the proposed project. However, Dr. Trice's report presented maps showing the limits of flooding for the Corps of Engineer's 1% flood and the standard project flood and estimated the potential damages for each flood. The magnitude of the peak discharge for these floods was 17,000 cfs and 34,000 cfs, respectively. Figure 5 on page 18 shows the limits of flooding for the Corp's 1% flood. The limits of flooding for the District's 1% flood (22,000 cfs) would be slightly larger than those shown in Figure 5.

Based on the Trice report, it can be concluded that the flooding which would result adjacent to the proposed project if a 1% flood occurred today would be from floodwaters which escaped from the river channel several miles upstream from the project reach. As can be seen from Figure 5, the floodwaters would break out of the channel in the reach from Taylor Street to San Carlos Street near downtown San Jose. These floodwaters would overtop the east bank and flow north away from the channel towards the highway interchange at State Route 17 and State Route 101 (Bayshore Freeway). The floodway followed by these waters would be up to two feet in depth and about one thousand feet wide. This area is generally the residential and commercial development east of the San Jose Civil Center.

Near the 17-101 interchange, floodwaters would flow northwest under State Route 17 at the Fourth Street undercrossing. Floodwaters would then spread out between First Street and State Route 101 and overtop State Route 101 in several places between State Route 17 and the main channel of the Guadalupe River. North of Bayshore Freeway, the flood waters would occur as sheet flooding parallel to First Street on the east side of the Guadalupe River flowing in a northwest direction towards Alviso. As the floodwaters near State Route 237 (Alviso-Milpitas Road), they merge with tidal floodwaters from the San Francisco Bay resulting in general inundation of the entire area including Alviso. Depths of flooding in Alviso would be on the order of five feet.

It is important to point out that the future flooding shown in Figure No. 5 will be significantly less than the historic flooding shown in Figure No. 4. This is attributable entirely to the flood control measures which have been installed in the Guadalupe River since 1963.

Although it is shown in the Trice report that flooding south of Alviso is presently a result of floodwaters escaping further south, this does not mean that the existing river channel between

Gold Street and Montague Expressway does not need to be enlarged. The contrary is true. As was noted in an earlier section, the existing river channel in this reach was originally constructed to pass a much smaller flow than the design flood presently used. Furthermore, land subsidence and sedimentation have reduced the channel's capacity. As a consequence of this inadequate channel capacity, any future upstream construction which would prevent flooding from its present sources would merely divert these floodwaters to a point of lower capacity downstream where flooding would again occur, possibly in areas which would not otherwise be flooded. Therefore, it is logical to enlarge the downstream channel to full capacity before upstream reaches are completely enlarged.

Design Flood Damages

The Trice report discussed in detail the potential damages which could be expected from the Corps' 100-year flood and the Standard Project Flood on the Guadalupe River. Although the Corps' 1% flood is smaller than the design flood, the magnitude of the damages would be similar.

Table 3 on page 23 lists the areas in acres subject to flood damages for the Corps' 1% flood and the Standard Project Flood and the total dollar damages for the same floods. The damages shown are based on January 1974, dollars and development and are for the floodplain area north of the 101-17 interchange and State

Route 17. As can be seen from Table 3, for the Corps' 1% flood, 18,570 acres of land would be inundated resulting in $20,000,000 worth of damage. The District's design flood would result in similar damages.

TABLE 3
POTENTIAL FLOOD DAMAGES [1]

GUADALUPE RIVER [2]

Flood Damage Category	Area Inundated (Acres)		Total Damages ($1000)	
	1% Flood [4]	S.P.F. [3]	1% Flood [4]	S.P.F. [3]
Residential	58	206	908	2,399
Commercial and Industrial	900	923	2,865	5,258
Public	3,637	4,772	7,332	7,970
Public Utilities	29	50	251	348
Vacant Lands	529	529	223	268
Agricultural	3,184	3,445	578	957
Salt Ponds	9,242	9,231	6,221	6,222
Streets and Sidewalks	125	500	131	525
Freeways	169	315	509	1,328
Railroads	37	40	315	316
Streams	660	660	693	694
TOTALS	18,570	20,671	20,026	26,280

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[1] Flood damage estimates obtained from report entitled "Potential Flood Damages on Guadalupe River, Coyote Creek, and Adjacent Streams", April 1974, by Andrew H. Trice, Ph.D.

[2] Flood damages for floodplain bounded by State Routes 17 and 101, and the San Francisco Bay.

[3] Standard Project Flood.

[4] For District's and Corps' design flood.

ALTERNATIVE SOLUTIONS STUDIED

This section will discuss the types of solutions reviewed as possible alternatives, the basic design criteria, the specific alternatives studied, and the estimated costs for the alternatives studied.

Alternatives Reviewed

There are many flood prevention and floodplain management alternatives available, in general, to protect the public and its property from flood damages. On any one project these potential alternatives are greatly reduced in number by the physical and environment controls of the flood prone area and the existing channel, by the economical aspects of the flood problem, by the financial limitations of the governing agency and by the social attitudes of the taxpayers. All of these factors, to some degree, narrow the practical alternatives to a manageable few. From these alternatives, the optimum project is selected.

With regard to the Guadalupe River, these factors combined to eliminate most of the possible alternatives. Previous studies by the U. S. Army Corps of Engineers on the Guadalupe River have indicated that the larger scale approaches such as upstream reservoirs, floodway bypasses, or floodplain management, were not economically feasible. Furthermore, environmental and social concerns in Santa Clara County generally preclude the use of channel construction which may produce adverse impacts on the existing environment. This type of flood control measure would be reconstruction of the existing channel by excavation, or replacement of the existing channel by a concrete lined channel or similar armor protected facility. Economic and financial constraints preclude the use of underground conduits for this magnitude of flood.

It, therefore, is apparent that the basic solutions worthy of further study are those which include preservation of the existing channel as much as possible and control of the potential floodwaters at a moderate cost. These criteria are most readily satisfied by solutions which involve constructing levees to an elevation which will contain the design flood with standard freeboard, or channel widening where environmentally and economically justifiable. This is the design concept adopted for this project.

Design Criteria

The preliminary design for all the alternatives studied was based on generally accepted engineering criteria for flood control projects. In some cases, the criteria has been established through District policy statements.

All alternatives were evaluated based on the criteria that the channel should be capable of conveying the 1% or one hundred year flood with standard freeboard. This is the standard policy of the District. The 1% flood is calculated from a statistical evaluation of historical streamflow data on the

Guadalupe River and other streams in the region. This data is adjusted to account for increased development in the tributary watershed which generally results in increased runoff during storms. For this reach of the Guadalupe River, the 1% flood has been calculated by the District to be 22,000 cubic feet per second.

In addition to the use of the 1% flood for design purposes, it has been established by the District that it will be assumed that when the peak flood flow occurs in the river the water level in the bay will be at elevation seven above mean sea level.

The water surface used to establish the top of levee elevations was calculated by use of a standard computer program for water surface profiles. It was assumed that a coefficient of channel roughness (Manning's n) of 0.025 would exist when the 1% flood occurred downstream of Montague Expressway. For the upstream reach, from Montague Expressway to Trimble Road, a value of 0.030 was used. It was also assumed that no channel excavation would be required to provide the necessary hydraulic capacity downstream of Montague Expressway. Freeboard, which is additional levee height provided to give a factor of safety during the design flood, was calculated based on the criteria that the channel depth be approximately 20 percent greater than the depth required to pass the 1% flood. The minimum freeboard is 2.5 feet. An additional one foot of freeboard was provided to allow for possible future land subsidence downstream of Montague Expressway.

An analysis was performed to determine the need for channel slope protection to prevent severe erosion from occurring. When the velocity of flow for the 2% (50 year) flood exceeds the allowable velocity in the channel, some type of armor protection should be provided. Such protection would be concrete lining, rock rip-rap, or gabion lining. Where velocities of flow exceeded the allowable values, and where the consequences of erosion would be significant, channel slope protection was included in the designs.

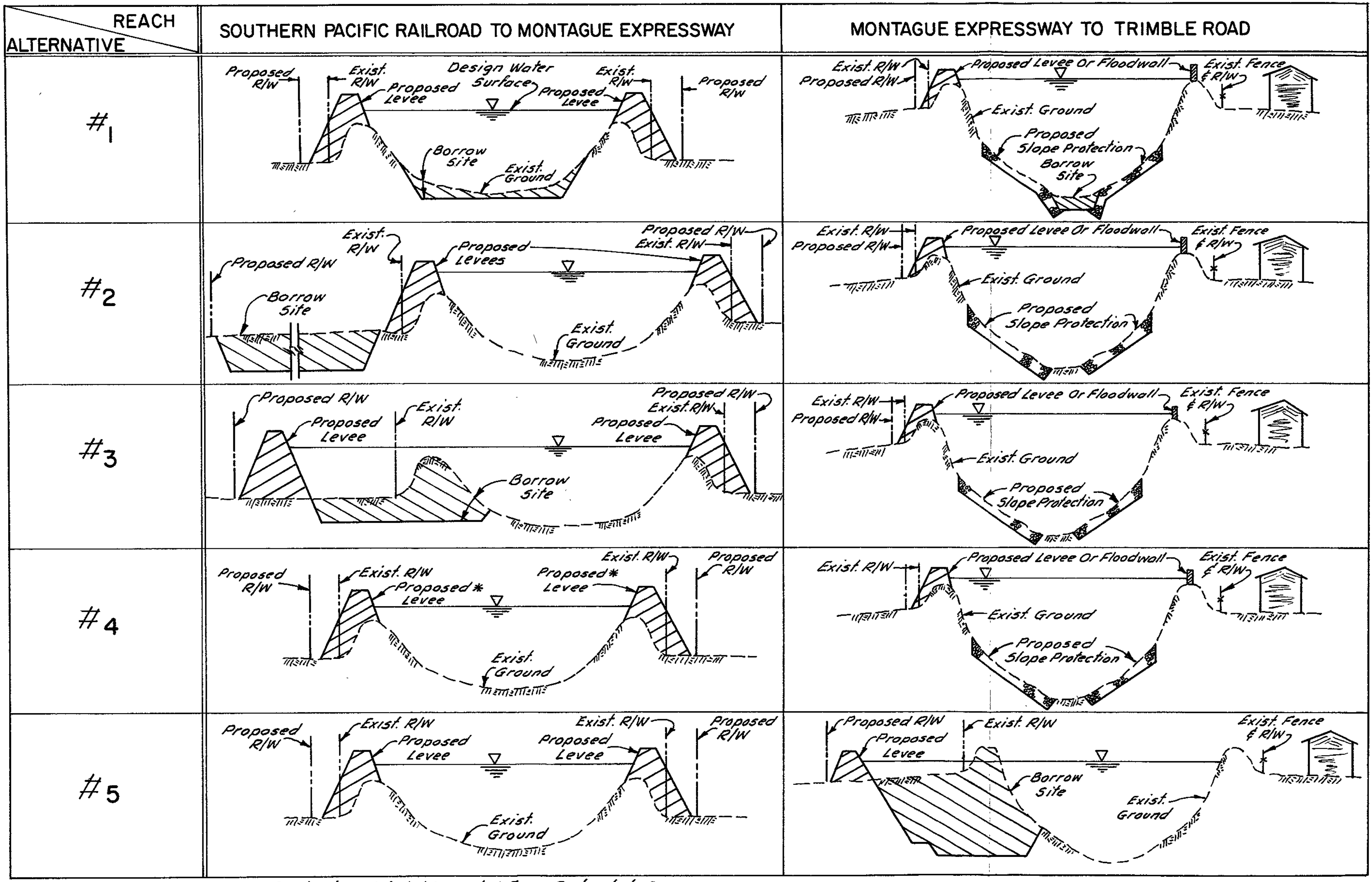
An evaluation was also made of the steepest channel side slopes which would be permissible for the proposed project. The analysis was based on information provided in a soils investigation report prepared by Woodward, Clyde, Sherard and Associates in November 1960. The final design side slopes reflect the conclusions derived from this evaluation and provide an adequate factor of safety against failure. The suitability of the excavated earth material for levee construction was verified by a soils investigation conducted by Jo Crosby & Associates in January 1976.

Description of Alternatives Studied

Five variations of the basic project concept were studied. These alternatives all included some form of levee construction between SPRR and Montague Expressway to accomplish the prime objective of controlling the design flood. Between Montague Expressway and Trimble Road, levee construction and channel widening were the primary alternatives considered. The variations between alternatives existed primarily in the final levee heights, levee locations, and source of material for the levee construction. Figure 6 on page 29 presents a summary of the typical cross sections for each alternative for the two principal subreaches. The five alternatives will be discussed briefly; the selected alternative, Alternative Number 5, will be discussed in detail in a later section. The estimated costs for each alternative will be discussed in the next section.

Alternative Number 1 consists of increasing the height of the existing channel levees to an elevation high enough to contain the 1% flood with adequate freeboard for the entire project reach. The levee alignment would remain essentially unchanged with only a slight shift away from the river. This shift occurs because all levee construction would be confined to the land side of the existing levee. The soil required to construct the levees under this alternative would be obtained from channel excavation in the river between the Hetch Hetchy Pipeline crossing and Trimble Road. Additional soil material would be imported by the contractor to supplement the river excavation source. This alternative would be essentially the the second stage of the construction that was done in 1963. (See Page 10 of this report.) This alternative has the disadvantage of destroying valuable riparian and tidal habitat and

FIGURE 6- TYPICAL CROSS SECTIONS FOR ALTERNATIVES
(SECTIONS LOOKING UPSTREAM)



* Levee Construction Material Imported From Contractor's Source.

could cause undesirable materials to enter the Bay. The U. S. Fish and Wildlife Service has recommended that this alternative not be used.

Alternative Number 2 is similar to Alternative Number 1, except for the source of construction materials. The levee alignment, height and width would be the same. The source of material for this alternative would be selected borrow sites along the project reach. These sites would be located to produce the most economical levee construction material. It would be necessary to purchase additional, large parcels of land for the borrow sites. The construction material would be excavated from the borrow sites, to depths of eight to ten feet, and transported to the levee construction sites. The principal disadvantage of this alternative is the problem created by the large, excavated areas which will remain after construction is complete.

Alternative Number 3 is a slight modification of the first two alternatives. This alternative would consist of relocating the existing levees away from the river in several places between SPRR and Montague Expressway. This would produce a modified floodplain type of channel. Excavation of the existing levee and the area between the existing and new levee would produce enough earth material to build the new levee. By widening the channel in several places, a slight reduction in the height of levees would be realized. This alternative would require the acquisition of considerably more right of way than the other alternatives. From Montague Expressway to Trimble Road, levee construction similar to Alternatives 1 and 2 would be required.

Alternative Number 4 is similar to Alternatives Number 1 and 2, except that the construction material would be imported from borrow sites selected by the contractor outside the project limits. The levee shape and location would be as previously described. The primary disadvantage of this alternative is the high cost of construction.

Alternative Number 5 is a combination of levee construction and channel widening. For the subreach from SPRR to Montague Expressway the construction would consist of levees similar to Alternatives Number 1, 2, and 4. From Montague Expressway to Trimble Road, construction would consist of widening the channel approximately 150 feet. This widening would produce three primary benefits in this subreach: (1) The water surface elevations during the design flood would be lower, thus allowing more freeboard than the other alternatives; (2) the flow velocities during the design flood would be non-erosive for most of the reach thereby reducing maintenance costs and downstream sedimentation and would eliminate any need for hard surface treatment of the side slopes; and (3) the excavated material could be used to construct the downstream levees.

Estimated Costs for Alternative Studied

Table 4 on page 33 presents a summary of the various project costs for the five alternatives studied. These costs are the total construction cost which includes landscaping, the right of way cost, and the engineering, inspection, administration, and contingency costs which include design, real estate acquisition, contract administration, and other miscellaneous administrative costs. These costs are based on January 1978 unit costs.

Alternative Number 5 has the lowest total project cost. This lower cost is attributable to two principal factors. First, the project concept produces a balanced earthwork approach which results in optimum use of earth resources. Secondly, by enlarging the channel from Montague Expressway to Trimble Road, the need for expensive rock slope protection in that reach is removed.

TABLE 4
PROJECT COSTS FOR ALTERNATIVES STUDIED

GUADALUPE RIVER

Cost Item	Alt. #1	Alt. #2	Alt. #3	Alt. #4	Alt. #5
	Costs x($1,000)				
Construction	2,265	2,060	1,992	2,346	1,500
Right of Way	475	1,000	1,475	475	973
Engineering, Inspection, and Administration	795	721	700	820	527
TOTALS	3,535	3,781	4,167	3,641	3,000

PROPOSED PROJECT

This section will describe the proposed project and will discuss the right of way needed for this project and the construction costs.

Project Description

The alternative selected for final design was Alternative No. 5 which was briefly described on Page 31 in the previous section. This alternative would produce the greatest overall benefits at the least cost while minimizing adverse social and environmental impacts. The proposed project is more easily described by subdividing the project reach into the two subreaches previously defined.

For the subreach from the Southern Pacific Railroad bridge in Alviso to Montague Expressway, new levees will be built on top of and adjacent to the existing levees. The new levees will have side slopes of two horizontal to one vertical (2:1) on both sides; the existing river side slope is at least 3:1. The top of the levees in this subreach will be 18 feet wide with wider areas at regular intervals to allow maintenance vehicles to turn around and to pass each other. The levees will range from three to twenty feet above adjacent ground and will range from zero to seven feet above the existing top of levees. Approximately 275,000 cubic yards of earth will be needed to construct the levees in this subreach. This earth material will come from excavation along the east bank of the river upstream of Montague Expressway.

The structural supports for the Hetch-Hetchy pipeline will be strengthened to resist increased loading created by more water in the channel. Approximately 33,000 feet of fence will be included. The fence construction will be necessary to replace existing fences disturbed by construction activities and to provide additional fencing. Seven existing drainage pipes will be extended to conform to the new levee slope.

The second subreach extends from Montague Expressway to the vicinity of Trimble Road. For this subreach, the principal construction item would be the widening of the existing channel approximately 150 feet. This widening would consist of excavating along the east bank but away from the existing significant riparian vegetation. The lower limit of excavation will be at an elevation slightly higher than the bottom elevation of the existing low flow channel. A low natural berm between the main channel and the overflow channel will remain. This will insure that low flows would continue to provide water to the existing habitat. Side slopes for the excavated section will be 3:1. In addition to the excavation, new levees will be constructed along the new east bank. These levees will have a top width of twelve feet and 2:1 side slopes. The levees will range in height from four to seven feet above adjacent ground. A maintenance access road will be at the toe of the proposed excavation along the east bank. The excavated material will be hauled downstream for levee construction as described previously. Fencing will be installed along the easterly R/W.

Along the west bank in this subreach no levee construction or channel excavation would be required.

In addition to the major earthwork items, slope protection to prevent erosion will be provided in selected areas. The channel slopes under the Montague Expressway bridge will be protected. The channel slopes and bottom under the Trimble Road bridge will also be protected. In addition to these bridge protection items, slope protection will be provided along the west bank for a distance of approximately 700 feet downstream of the Trimble Road bridge.

Revegetation will be a part of the project to mitigate the environmental impacts, and to enhance the aesthetics of the project area. Plant materials chosen for this purpose will be native and naturalized plants which are low in water requirements, high in wildlife resources, and low in maintenance needs. In addition, the plant materials will be chosen for their erosion control ability, natural color and aesthetic qualities, and their compatibility with recreation uses. The landscape management efforts will be directed toward establishing a natural appearance along the river banks and maintaining an "environmental corridor" along the river. Bridge crossings will receive greater emphasis on rapid aesthetic improvement, being the points of greatest visual impact. Choice and placement of trees and plant masses will be conducive to and will not preclude future addition of recreational facilities such as equestrian or bicycle trail, picnic stops, and neighborhood parks.

The specific details and dimensions of this project are shown in Plates 1 through 24 at the end of this report.

Project Right of Way

To construct the proposed project, approximately 33 acres of additional right of way are needed. The limits of the right of way for the proposed project are shown on Plates 4 through 21. The new right of way consists principally of narrow strips of land adjacent to the existing District right of way line. No inhabited dwelling would be affected by these acquisitions.

For the first subreach, SPRR to Montague Expressway, approximately one acre of land will have to be acquired to provide for the slopes of the new levees. From State Route 237 to Montague Expressway, approximately 16 acres of land consisting of two 30-foot-wide strips adjacent to the existing right of way will have to be acquired. Where this strip of land would have impacted existing, inhabited dwellings, the levees were realigned to eliminate this impact.

For the second subreach, Montague Expressway to Trimble Road, an additional 16 acres of new right of way is required. This acquisition will consist of a strip along the east side varying in width from 150 feet near Montague Expressway to 125 feet near Trimble Road.

Project Costs

Estimates of the construction costs of the proposed channel improvements to Guadalupe River are based upon January 1978 prices. Contingency items are estimated to account for the cost of engineering, construction inspection, advertising, legal fees and administrative costs. The estimated costs are presented in Table 5 on page 39.

Project Financing

The financing of the proposed project will be from the ad valorem tax in the Central Zone.

TABLE 5

ESTIMATED PROJECT COSTS

Subreach Limits	Construction[1]	Engineering & Inspection @ 35%	R/W	Total
SPRR to Montague Expy	945,000[3]	332,000	413,000	1,690,000
Montague Expy to Trimble Rd.	555,000[2]	195,000	560,000	1,310,000
	$1,500,000	527,000	973,000	3,000,000

[1] Includes landscaping costs.

[2] Earth work costs include excavation and loading.

[3] Earth work costs include transporting, placing and compacting earth material.

Estimated costs are based upon January 1978 dollars.

CONCLUSIONS AND RECOMMENDATIONS

It is apparent from the discussion presented in this report and in previous reports that a significant flood hazard exists in the vicinity of the proposed project and on other reaches of the Guadalupe River. Historic evidence, as well as projections based on predicted floods, confirm that serious damages from flooding along Guadalupe River can be expected in the future. Damages in excess of $27,000,000 from one flood could be expected for the entire river and damages in excess of $20,000,000 could be expected in the project vicinity.

The proposed project described herein is the most economically and environmentally acceptable way to upgrade the capacity of Guadalupe River, between SPRR in Alviso and State Route 17 to the 1% flood level. The Corps of Engineers is currently conducting a study for flood protection on the Guadalupe River between Curtner Avenue and State Route 17. If the Corps' study is approved, the Corps will construct the improvements to Guadalupe River between Curtner Avenue and State Route 17. In the meantime, water can still break out of Guadalupe River upstream of Taylor Street in San Jose and run overland to Alviso. The proposed project will provide protection from flooding to the floodplain area west of the Guadalupe River between Southern Pacific Railroad and Trimble Road. This area contains approximately 250 acres of residential development, 100 acres of commercial-industrial property, and about 350 acres of open space property which includes a public golf course, Agnews State Hospital and the City of Santa Clara's east side retention basin.

The proposed project is the only remaining work to be done on Guadalupe River between San Francisco Bay and Curtner Avenue, with the exception of some erosion control work, that is not included in the Corps of Engineers' future project for Guadalupe River. The proposed project should be completed before the Corps closes the gap upstream of Taylor Street, so that water that now travels overland can flow safely down Guadalupe River through the project reach.

Assessment of the potentials for damage, along with consideration of the benefits and the minimal adverse environmental impacts, leads to the conclusion that flood protection works should be provided for the area.

Based on these conclusions, it is recommended that the Flood control improvements as described under Alternative 5 be approved and construction be undertaken.

APPENDIX A

PERSONS TO CONTACT FOR MORE INFORMATION

About this Report

G. Thomas Dean
Project Engineer
Santa Clara Valley Water District
265-2600, extension 313

About Flood Insurance

Carroll Church
Santa Clara Valley Water District
265-2600, extension 353

About Environmental Considerations

Dr. Bernard Goldner
Santa Clara Valley Water District
265-2600, extension 350

About Creek Maintenance

Donald Erling
Santa Clara Valley Water District
265-2600, extension 360

About Right of Way Acquisitions

Donald Lawrie
Santa Clara Valley Water District
265-2600, extension 261

APPENDIX B

NEGATIVE DECLARATION

Project: Proposed Flood Control Project for Guadalupe River, Project No. 3015, Central Flood Control Zone.

Location: Guadalupe River between Southern Pacific Railroad Bridge and Trimble Road in the Cities of San Jose and Santa Clara, Santa Clara County, California

Purpose: This project, in conjunction with other upstream improvements, will provide one percent flood protection to adjacent lands.

Project Description: The Project is divided into two subreaches. The first is from the Southern Pacific Railroad Bridge in Alviso upstream to Montague Expressway. This subreach will have new levees from 0 to 7 feet high constructed on top of the existing levees; about 275,000 cubic yards of earth are needed for this part of the project. The necessary fill will be entirely generated from excavation of the east bank of the river upstream of Montague Expressway.

The second subreach is from Montague Expressway upstream to Trimble Road. The excavation described above to provide fill material will widen the existing channel about 110 feet. Care will be taken to avoid significant riparian vegetation in the channel. This design will leave a low flow channel. Additionally, a new levee, varying from 3 to 7 feet high will be constructed on the east bank of this subreach; no excavation or new levee is needed on the west bank.

The project also includes new structural supports for the Hetch Hetchy pipeline where it crosses the river, replacement of approximately 2,200 feet of chain-link fence and 1,400 feet of barbed wire fence, extension of seven existing drainage pipes, and modification of several existing irrigation systems.

When completed, the project will be landscaped to mitigate the impacts of the channel excavation. Landscape design and selection of plant materials will be compatible with possible future recreation facilities along the river corridor.

Finding: Based on an Initial Study (attached) pursuant to Section 15080 of the State EIR Guidelines, staff has determined that the proposed project will not have a substantial adverse impact on the environment; however, there will be some unavoidable short- and long-term adverse impacts.

The principle grounds of this finding include the following considerations. Nearly all the adverse effects of the project will result from construction activities. The impacts include dust, noise, construction traffic, and a minor temporary increase in surface erosion. Approximately 33 acres of additional right of way will be required, a portion of which is now active agricultural land but planned for industrial uses. No inhabited structures will be affected by the project. The project has been designed to avoid removal of significant riparian vegetation.

This Negative Declaration was prepared by Dr. Bernard H. Goldner, Environmental Specialist.

December 7, 1976

The above Negative Declaration was approved by the Santa Clara Valley Water District Board of Directors on December 7, 1976.

Violet V. Enander

Violet V. Enander
Clerk of the Board
Santa Clara Valley Water District

Guadalupe River
(SPRR to Trimble Road)

ENVIRONMENTAL IMPACT ASSESSMENT CHECKLIST

Explanations of all "Yes" and "Maybe" answers are required on attached sheets. If directly related to construction activities or temporary, indicate with a "C" or "T" under Yes or Maybe.

	Yes	Maybe	No
1. Geology and Soils. Will the project result in:			
a. Is there any hazard to the public resulting from geologic features of the site (landslide-prone areas, faults, slumping, etc.). If so, will the project increase the hazard?			X
b. Unstable soil conditions or contribute to land subsidence?			X
c. Serious disruptions, displacements, compaction, or impervious covering of the soil? Introduction of toxic materials in the soil or reduction of soil fertility?			X
d. Significant change in topography or ground surface relief features?	X		
e. The destruction, covering or modification of any unique geologic or physical features?			X
f. Any increase in wind or water erosion of soils, either on or off the site?	T		
g. Changes in siltation, sediment transport, deposition or erosion which may modify a river, stream, or other body of water?		X	
2. Air. Will the project result in:			
a. Generation of air emissions (such as dust) that will seriously deteriorate air quality standards (either locally or regionally)?		C	
b. The creation of objectionable odors?			X
c. Major alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?			X

	Yes	Maybe	No
3. Water. Will the project result in:			
a. Changes in currents, or the course or direction of water movements?			X
b. Changes in infiltration rates, sedimentation, drainage patterns, or the rate and amount of surface water runoff?		X	
c. Alterations in the course or flow of floodwaters or an increase in downstream flood potential?	X		
d. Change in the amount of surface water in any body of water?			X
e. Contamination or any detrimental effect on existing water quality or quantities of either surface or sub-surface supplies?		T	
f. Change in the quantity of ground-waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?			X
g. Reduction in the amount of water otherwise available for public water supplies?			X
4. Noise. Will the project increase existing noise levels during construction or operations to the extent that existing or future residents would be annoyed?		C	
5. Plant Life. Will the project result in:			
a. Change in the diversity of species, or numbers of any species of plants (including trees, shrubs, grasses, microflora, and aquatic plants)?			X
b. Reduction of the numbers of any unique, rare or endangered species of plants?			X
c. Introduction of new plant species into an area, or a barrier to the normal replenishment of existing species?	X		

	Yes	Maybe	No
d. Reduction in acreage or yield of any commercial or agricultural crop?	X		
6. Animal Life. Will the project result in:			
a. Changes in the diversity of species, or numbers of any species of animals (birds, land animals, including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?			X
b. Loss or disturbance of a nesting area for resident or migrating birds?			X
c. Reduction of the numbers of any unique, rare or endangered species of animal?			X
d. Introduction of new species of animal into an area, or result in a barrier to the migration or movement of animals (or fish)?	X		
e. Deterioration of existing fish or wildlife habitat?		C	
7. Land Use/Community Plans and Values. Will the project result in:			
a. Alteration or nonconformance with regional, federal, state or local land use plans and policies of the surrounding area?			X
b. Conflict or inconsistency with adopted policies, plans and goals of the community where the project is located?			X
c. Deterioration of the integrity or quality of the surrounding neighborhood? Loss of privacy or security to residents over the long term?			X
d. Generation of a substantial public controversy resulting from environmental concerns?			X

	Yes	Maybe	No
8. Economic. Will the project:			
a. Foster economic or population growth, either directly or indirectly, in the surrounding area (particularly if faster than planned for)?		X	
b. Remove a major constraint or obstacle to growth?			X
c. Decrease employment in the community?			X
9. Population. Will the location, distribution, character, or density of the surrounding human population be altered by the project?			X
10. Housing. Will the project adversely affect existing housing or result in the relocation of existing housing?			X
11. Transportation/Circulation. Will the project result in:			
a. Impact upon existing transportation systems?		C	
b. Reduction in existing parking facilities, or create demand for new parking?			X
c. Alterations to present patterns of circulation or movement of people and/or goods?		C	
d. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?		C	
12. Public Services. Will the project have an effect upon or result in a need for new or altered governmental services in any of the following areas:			
a. Fire or police protection?			X
b. Schools?			X
c. Parks or other recreational facilities?			X

	Yes	Maybe	No
d. Maintenance of public facilities (streets, highways, public transit, etc.)?			X
e. Flood protection?			X
f. Other governmental services?			X
13. Utilities. Will the project result in a need for new systems, or alterations to the following utilities:			
a. Power or natural gas?			X
b. Communications systems?			X
c. Water?			X
d. Sewers or septic tanks?			X
e. Storm water drainage?			X
f. Solid waste disposal?			X
14. Energy. Will the project result in:			
a. Use of substantial amounts of fuel or energy?			X
b. Substantial demand upon existing sources of energy, or require the development of new sources of energy?			X
15. Public and Environmental Health. Will the project result in:			
a. Creation of any known human health hazard or potential health hazard (excluding mental health but including physical injury)?			X
b. Involve the application, use, or disposal of toxic or hazardous materials?			X
16. Aesthetics. Will the project result in the obstruction of any scenic vista or view open to the public, or will the project result in the creation of an aesthetically offensive site or structure presently or potentially open to public view?		C	

	Yes	Maybe	No
17. Recreation. Will the project result in an impact upon the quality or quantity of existing recreational opportunities (such as fishing, boating, hiking, horseback riding, bicycling)?		X	
18. Archeological/Historical. Will the project result in an alteration of a significant known archeological or historical site, structure, object or building? Is the project in a known archeologically sensitive area?			X
19. Natural Resources. Will the project substantially increase the consumption of an non-renewable natural resource such as minerals, precious metals, prime agricultural land, natural gas, oil, etc.?			X

DETERMINATION

On the basis of this initial evaluation:

☒ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project.

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Winthrop A. Stiles III
Prepared by

Assistant Environmental Specialist
Title

Date: ____________________

DISCUSSION OF ENVIRONMENTAL EVALUATION

1d. The proposed project will include constructing levees from 3' to 7' tall above existing ground.

1f. Temporarily increased surface soil erosion may occur during construction and will continue until stabilization occurs.

1g. If surface soil erosion occurs during construction, river sedimentation may temporarily increase until revegetation occurs.

2a. Exhaust gas emissions from construction equipment may temporarily degrade air quality locally; windblown dust also is likely to increase during and after construction until the newly cut soil surfaces stabilize.

3b. Slow velocities of water in the creek may contribute to sedimentation.

3c. The proposed project, when coupled with other upstream improvements, will channel floodwaters out to the Bay without allowing the surrounding land to flood.

3e. Water quality may temporarily degrade from increased siltation during and after construction, until surface erosion can be stabilized.

4. Noise levels will be temporarily increased in the project area due to construction equipment; no noise level increases will result from operation of the project.

5c. After project construction is completed, the project area will be landscaped. The plant materials, although largely native and naturalized, will be new to the existing area.

5d. Some agricultural acreage will be required to accommodate the enlarged channel; this land will be a strip along the existing channel; however only a portion of the project will require taking right of way in agricultural land.

6d. It is likely that once the project area is landscaped, the new habitat will attract wildlife to the area that are not present at the site now.

6e. Temporarily deteriorated water quality during and following construction may be expected to adversely the existing fishery. Removal of some vegetation can also be expected to have some effect on wildlife; however this type of habitat rapidly re-establishes itself shortly after construction. Additionally, the project area will be landscaped after construction.

8. Undeveloped areas east of the proposed project have not been developed due to the lack of urban services. Lack of flood protection is not considered a growth constraint since the flooding depths would be about 3 feet, a depth which could be overcome by "padding up" building foundations above this level.

11a. Traffic on adjacent streets may be affected by construction vehicles.

11c. Traffic flow may be altered to accommodate construction vehicles.

11d. Presence of heavy construction equipment may pose temporary traffic hazards.

12c. Project design can accommodate future recreational facilities, if desired by the community; this would be a positive project impact.

16. The higher levees may constitute an obstruction to view. Initially, the levees may also be aesthetically objectionable; however, when vegetated, their appearance will be softened.

17. Upon completion, the project area could significantly improve recreational amenities for the surrounding area if the community desires to include the project reach in future park plans.

APPENDIX C

THE ONE PERCENT FLOOD

The one percent flood is that flow of water from a drainage area that has a one percent chance (probability of 0.01) of occurring in any given year. It is equivalent to the so-called 100-year flood, but it should not be thought of as an event that occurs regularly every 100th year. Instead, it is the flood flow event that would be equaled or exceeded about 100 times in 10,000 years. It is also possible that two repetitions of this flood flow could occur in a single year, or that a single event may not occur even once in 200 years.

The "one percent flood" is the preferred description of the design flood. However, the term "100-year flood" is equivalent. Unfortunately, this latter term often leads to the misconception that the design flood occurs only every 100th year.

Another terminology problem is the relation of the one percent storm and the one percent flood. The storm magnitude relates to flood magnitude through a complex set of parameters such as antecedent rainfall conditions, drainage basin shape, length, slope, orientation, and others. Therefore, a one percent storm will not necessarily produce a one percent flood. The one percent flood should not be confused with nor should it be referred to as the one percent storm flood.

The one percent flood has a small risk of occurrence in a given year, but this risk is accumulative. When compared with the 30-year life of the average home loan, for example, the chance that it will occur is quite large. During the 30-year loan period, the chance that a one percent flood will occur, or be exceeded, approaches 30 percent.

The magnitude of the one percent flood must be calculated using statistical hydrological (stochastic) methods. Since it is the desire of the District to provide equal protection from flooding to all residents, a uniform method of determining design flood flows is required; one that is regional in scope and one that minimizes the chance of providing unequal protection from one area to another. This objective is reached through a regional peak flood frequency analysis that uses the best available hydrologic data from stream systems in and adjacent to the District. The regional process utilized by the District was developed after considerable effort and has been reviewed and approved by the academic and professional community.

The research on the statistical measurement of flood flows and frequencies has shown that the larger magnitude floods that occur at relatively infrequent intervals, such as the one percent flood, are products of extremely heavy rainfalls, either exceptionally high intesity or of long duration. With exceptionally high-intensity rainfall, so much rain falls in a short period of time that no matter what the ground cover is - soil, pavement, grass, trees, or buildings - the water cannot be stored or soaked up, and it runs off in a flood. With long-duration rainfall, a lot of rain falls, but it comes over a long period of time. Bare soil, grassland, forests, landscaping, house roofs, and pavement become fully saturated, and flooding occurs when no more water can be absorbed, stored, or evaporated. Thus, for large floods, the type of development or degree of urbanization that exists in the total watershed has essentially no effect on the magnitude of the peak flood flow that is generated.

However, the situation is different for the small magnitude floods which occur at frequent intervals. In these, the rainfall intensity is less or of shorter duration. The absorption, holding, or storage characteristics of the land are much more important. With much less water present, soil, grass, and forests tend to soak up and hold back the rain that falls, while pavement and house roofs let a large percentage run off.

Therefore, when grassland is converted to pavement, the amount of water that runs off is much greater for the small amounts of rainfall. The magnitude of the small, more frequent type of flood flow is increased by urbanization.

In discussing flood flows and urbanization, there is one additional factor that should be mentioned. This is over-bank storage in floodplain areas. Where urbanization occurs in the floodplain and the stream is channelized, the storage of over-bank floodwaters is reduced. This results in greater downstream flood flows. This increase in flood flows occurs for any magnitude or frequency of flooding that would have resulted in channel overflow and storage of waters in the floodplain.

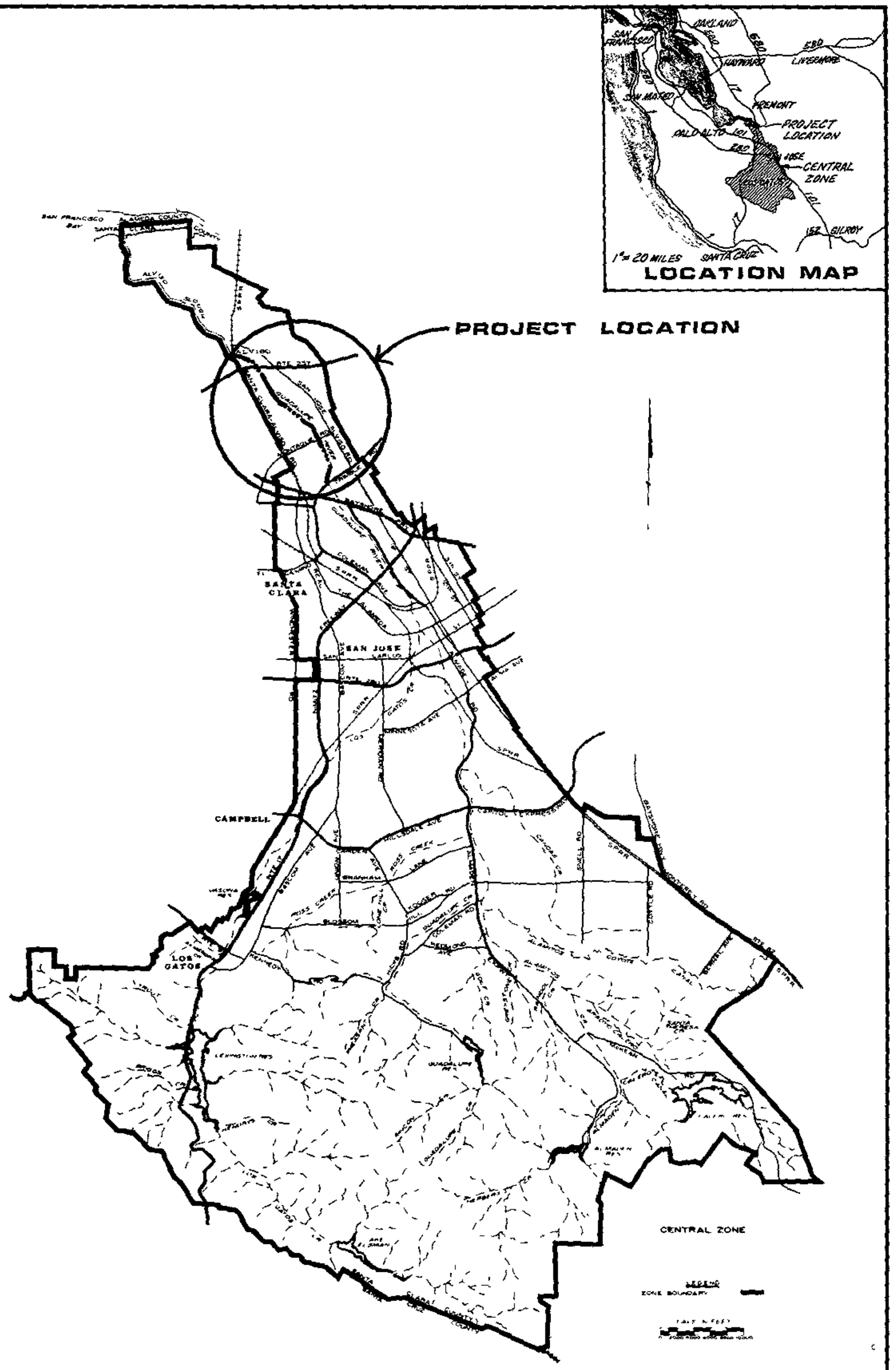
Lloyd C. Fowler
October 21, 1974

APPENDIX D

GLOSSARY OF TERMS

cfs or Cubic Feet Per Second	A rate of flow that would fill a container of 1 cubic foot size, that is about 7½ gallons, in one second.
Design Flow	The magnitude of streamflow that is used in design of channel improvements and structures across the channels.
Drainage Area	Area that drains into a body of water such as a stream or a reservoir.
Freeboard	Vertical distance between the top of an embankment adjoining a channel and the water level in the channel. It is a factor of safety designed into a project.
Gabions	Wire baskets filled with graded rocks and gravel. These baskets are used as erosion protection works on channels.
Low Flow Channel	That section of stream which carries the more frequent, periodic streamflows.
Erosion	Loss of soil from bank or bed of a creek, causing undercutting of banks; ultimate result could be bank failure.
Flood	The temporary inundation of lands normally dry; any waters escaping from a creek or river.
Flood Control Zone	A zone established by the Santa Clara Valley Water District for the purpose of limiting use of tax funds available from a certain area (zone) for the improvements and services in tha particular area only. There are five flood control zones in Sant Clara County.

Negative Declaration	A statement by an environmental specialist stating that a proposed project will not have any significant adverse environmental impacts. This statement is prepared as required by California Environmental Quality Act.
One Percent Flow	A flow which has a one percent chance of being equaled or exceeded in any year. It is also popularly known as the "100-Year Flow" (See Appendix C).
Reach	One continuous stretch or section of a river or stream.
Subsidence	Loss of ground elevation due to compaction of underground soil layers, primarily caused by overpumpage of groundwater.
Velocity	Speed with which water would flow in a channel. It depends on sever factors, such as slope, smoothnes and uniformity of channel, area o flow, and wetted perimeter.
Watershed	Area that drains into a body of water such as a stream or a reservoir.



MAP AND GENERAL PLAN

FOR

FLOOD CONTROL MEASURES FOR THE

GUADALUPE RIVER

SOUTHERN PACIFIC RAILROAD (SPRR) TO TRIMBLE ROAD

Santa Clara Valley Water District

CENTRAL FLOOD CONTROL ZONE

PROJECT NO. 3015

INDEX

SHEET NO.	DESCRIPTION
1	MAP & TITLE PAGE
2	INDEX MAP
3	TYPICAL CROSS SECTIONS & GENERAL INFORMATION
4-24	PLAN & PROFILE

$\frac{1}{10}$ 1 INDICATES DETAIL NUMBER
10 INDICATES NUMBER OF SHEET ON WHICH DETAIL APPEARS

$\frac{A}{10}$ A INDICATES SECTION
10 INDICATES NUMBER OF SHEET ON WHICH SECTION APPEARS

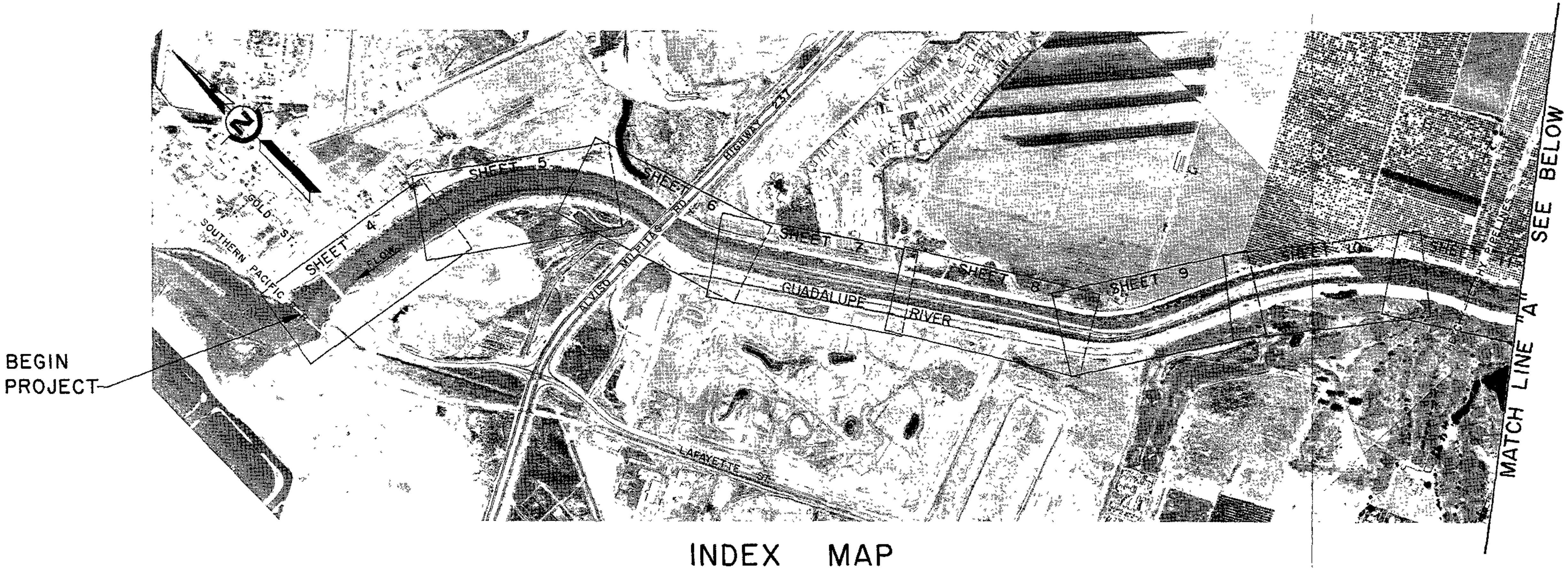
REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

PROJECT APPROVAL.

George Kortay
DESIGN AND CONSTRUCTION MANAGE

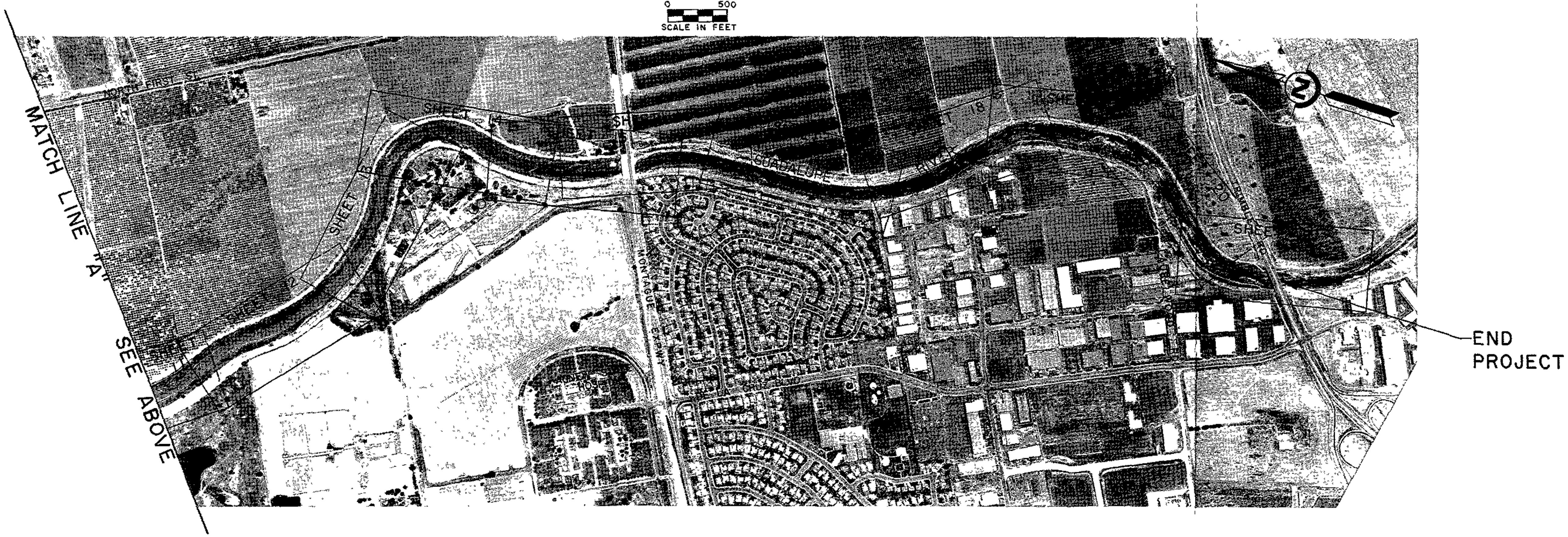
Lloyd C Fowl
CHIEF ENGINEER

DATE: 30 Jan. '78



INDEX MAP

0 500
SCALE IN FEET



REFER TO TRACING FOR LATEST REVISION			
REV	DESCRIPTION	SUB	APPP

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY: JUNE 1974

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE	Jan. 78
DESIGN	L.P.
DRAWN	F.S.W.
CHECKED	G.T.O.

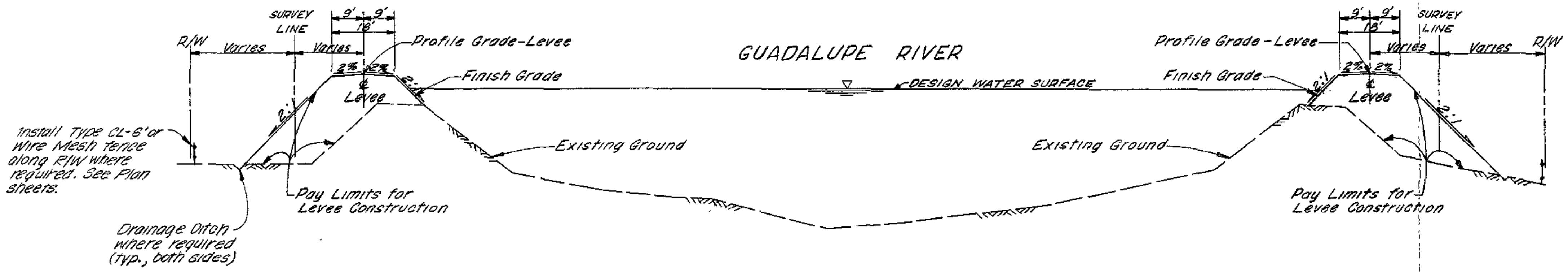
Santa Clara Valley Water District

ENGINEERING CERTIFICATION
PROJECT ENGINEER R.C.E. NO 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO 15851

ENGINEERING APPROVAL
Edwin
HEAD DESIGN BRANCH R.C.E. NO 14455

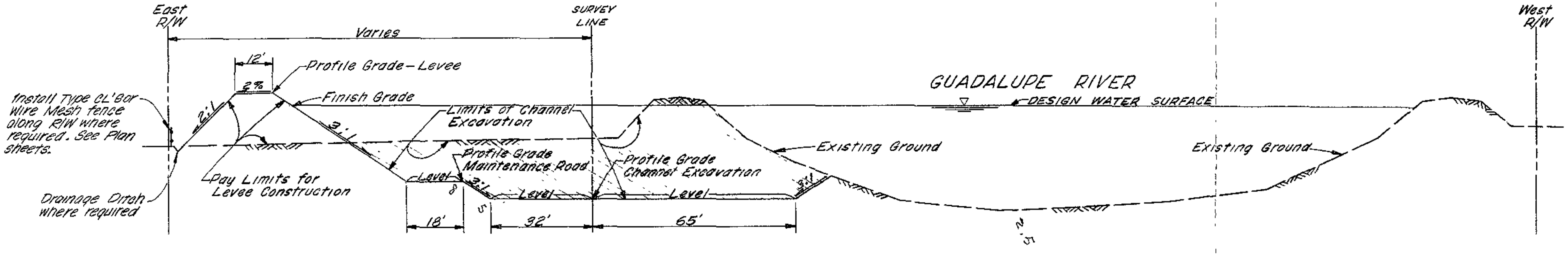
INDEX MAP
GUADALUPE RIVER
SPRR TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
As Shown
SHEET
2
OF 24


R/W
Varies
SURVEY LINE
Varies
9'
9'
18'
Profile Grade-Levee
2%
2%
℄ Levee
2:1
Finish Grade
GUADALUPE RIVER
DESIGN WATER SURFACE
Install Type CL-6' or Wire Mesh fence along R/W where required. See Plan sheets.
Existing Ground
Pay Limits for Levee Construction
Drainage Ditch where required (Typ., both sides)
Profile Grade-Levee
Finish Grade
Existing Ground
Pay Limits for Levee Construction
SURVEY LINE
Varies
R/W

TYPICAL CROSS SECTION A

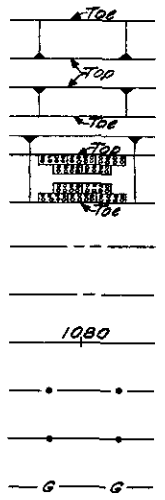
Sta. 1022+65 to Sta. 1182+40 (East Side)
Sta. 24+45 to Sta 99+00 (West Side)
Sta. 138+30 to Sta. 180+69 (West Side)
NOT TO SCALE


East R/W
Varies
SURVEY LINE
West R/W
12'
Profile Grade-Levee
2%
Finish Grade
2:1
3:1
Limits of Channel Excavation
Install Type CL'6' or Wire Mesh fence along R/W where required. See Plan sheets.
Pay Limits for Levee Construction
Drainage Ditch where required
Level
Profile Grade Maintenance Road
3:1
Level
Profile Grade Channel Excavation
Level
3:1
GUADALUPE RIVER
DESIGN WATER SURFACE
Existing Ground
Existing Ground
18'
32'
65'

TYPICAL CROSS SECTION B

Sta. 1190+45 to Sta. 1240+00
NOT TO SCALE

LEGEND



Construct Channel or Levee Bank
Construct Gabion Slope Protection
R/W Line
Center Line (℄)
Survey Line
Existing Fence (Type Shown on Plan)
Construct Fence (Type Shown on Plan)
Existing High Pressure Gas Line

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

REFER TO TRACING FOR LATEST REVISION			
REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. For cross section details in locations not covered by the cross sections shown on this sheet, refer to the plan sheets.
2. All cross sections are taken looking in the direction of increasing stationing, unless noted otherwise.
3. Basis of elevations is Bench Mark TBM 32A as shown on sheet 6.

DATE Jan. 78
DESIGN L. P.
DRAWN F. S. W.
CHECKED G.T.D.

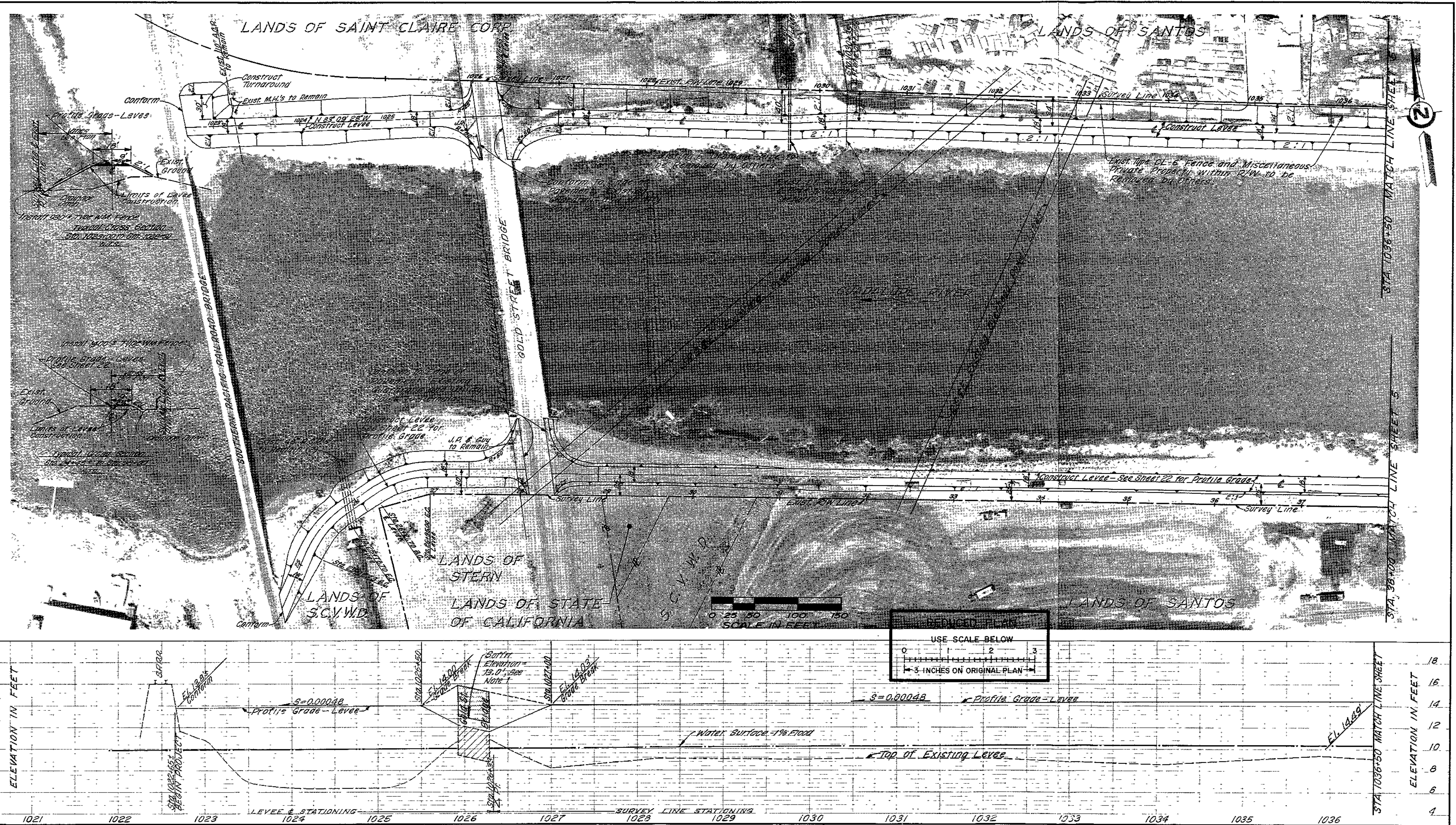
Santa Clara Valley Water District

ENGINEERING CERTIFICATION
PROJECT ENGINEER R.C.E. NO 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO 14455

TYPICAL CROSS SECTIONS
AND GENERAL INFORMATION
GUADALUPE RIVER
S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE As Shown
SHEET 3 OF 24



REFER TO TRACING FOR LATEST REVISION		
DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. Proposed Soffit Elevation of Gold St. Bridge. Bridge Raising is not part of this Project.

DATE OF PHOTOGRAPHY 5-12-72

DATE Jan. 78
DESIGN BJM/LP/L.P.
DRAWN F. S. W.
CHECKED G.T.O.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 23948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

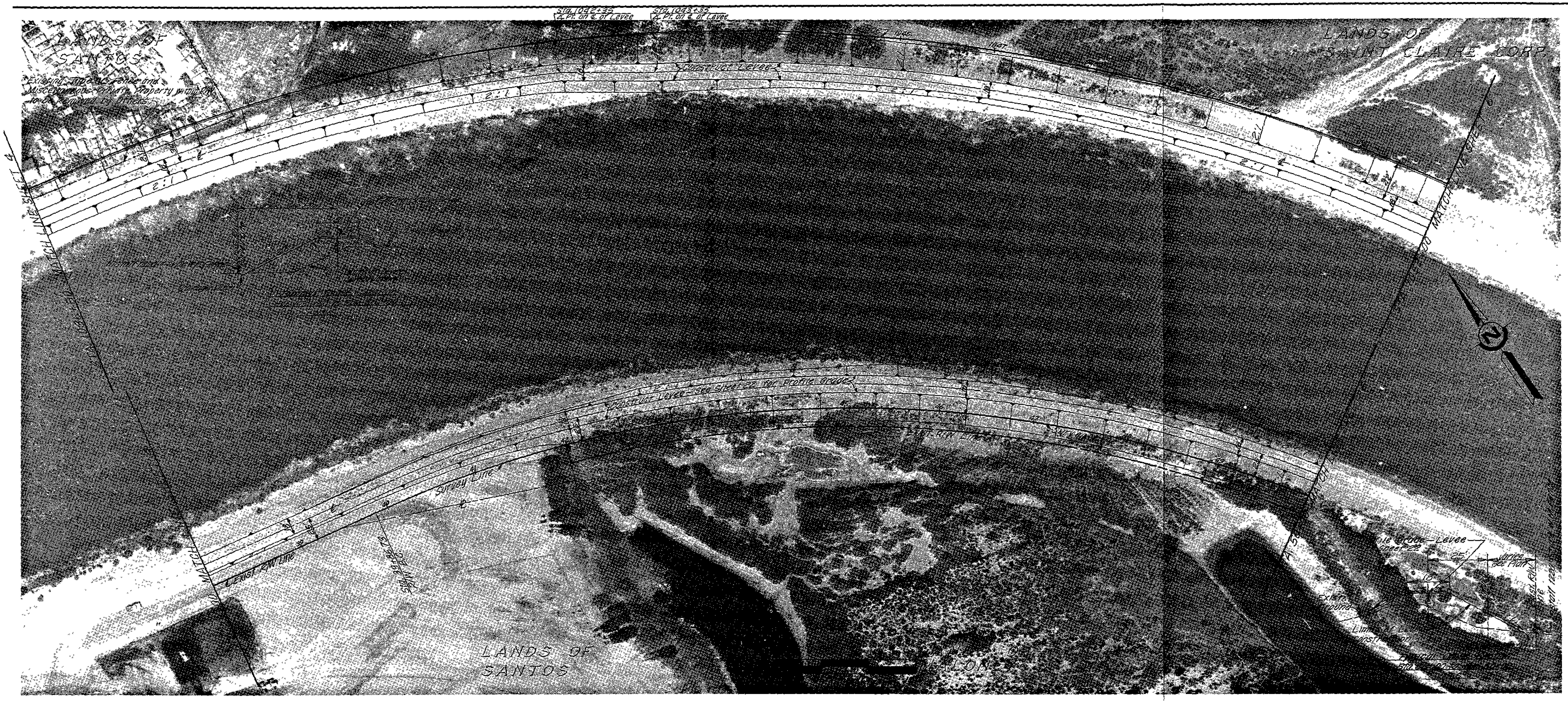
ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO. 14455

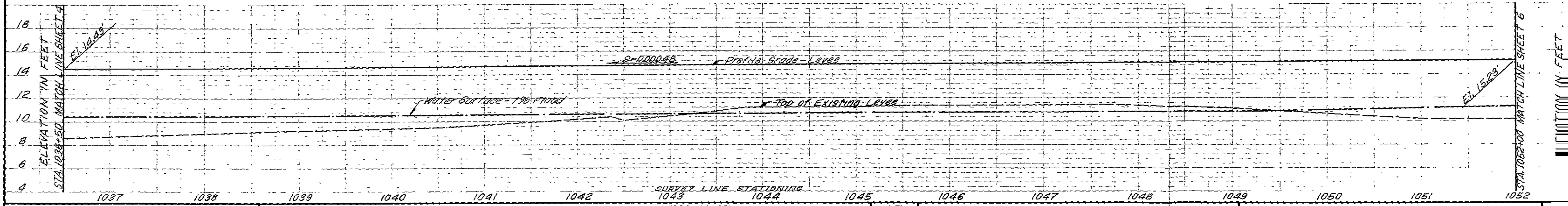
PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
Hor. 1" = 50'
Ver. 1" = 4'

SHEET 4 OF 24


Sta. 1042+35
∠ Pt. on ℄ of Levee
Sta. 1043+35
∠ Pt. on ℄ of Levee
LANDS OF SANTOS
Existing Type ... Fence and Miscellaneous Private Property within R/W to be Removed by Others
Construct Levee
2:1
LANDS OF SAINT CLAIRE CORP.
MATCH LINE SHEET 4
MATCH LINE SHEET 6
Construct Levee - See Sheet 22 for Profile Grade
Exist. R/W Line
Survey Line
LANDS OF SANTOS
...LONE
Profile Grade - Levee Sheet 22
25'
18'
Varies See Plan
Exist. Ground
Limit of Levee Construction
N



REFER TO TRACING FOR LATEST REVISION

NO.	REVISION	SUB.	APPR.

REFERENCE INFORMATION AND NOTES

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE
Jan. 78
DESIGN
B.J.M./J.P.
DRAWN
F. S. W.
CHECKED
G.T.O.

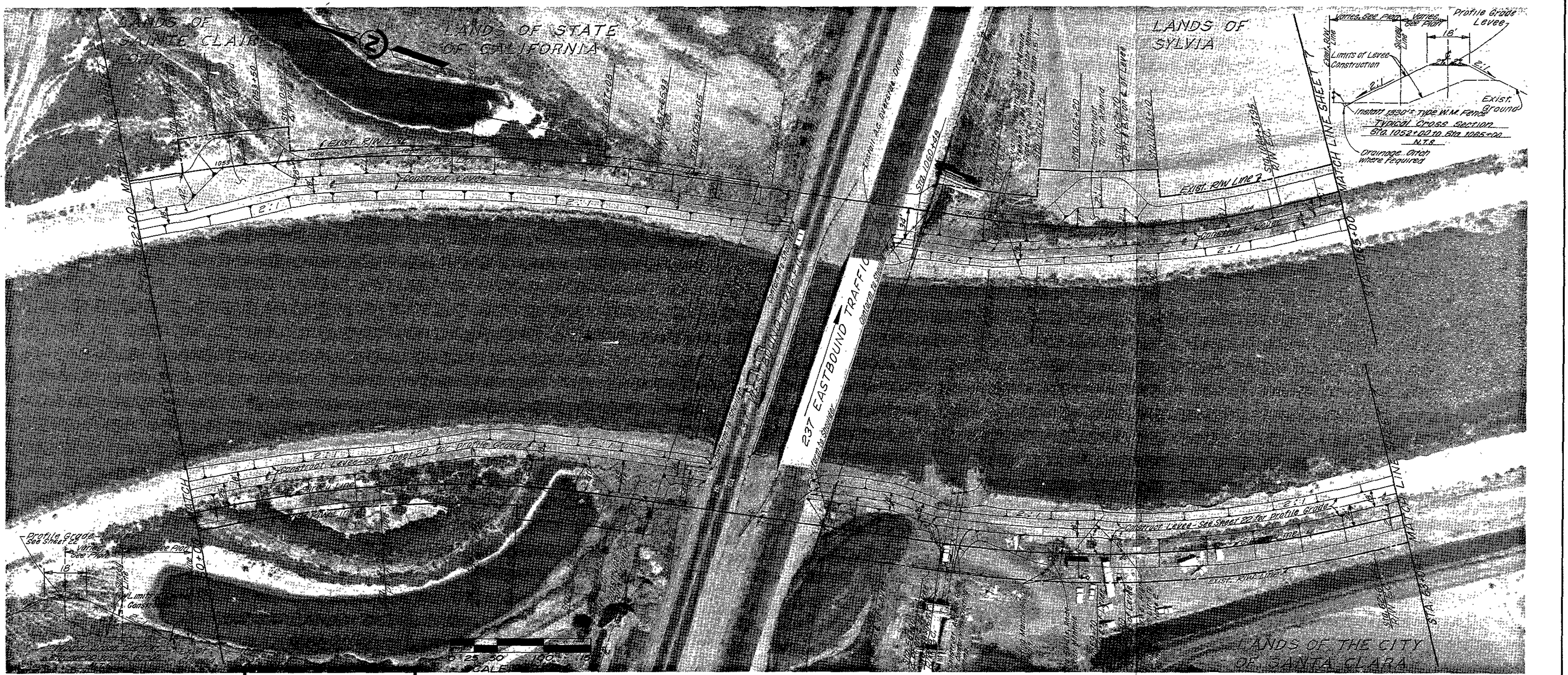
Santa Clara Valley Water District

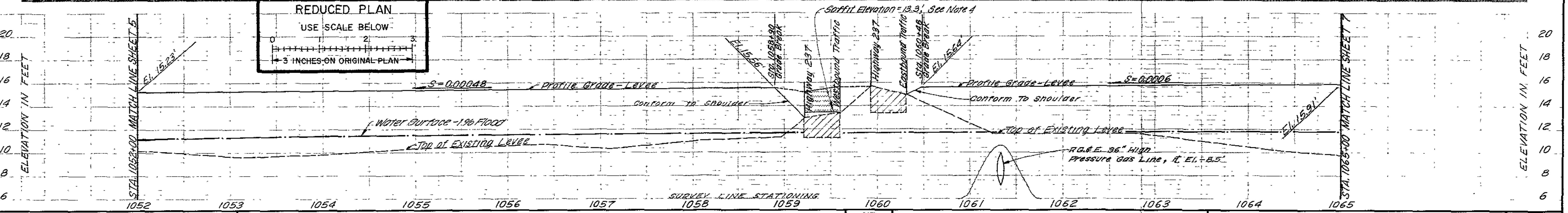
ENGINEERING CERTIFICATION
B. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22949
Bruce Welsh
DIVISION ENGINEER R.C.E. NO. 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE
GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE





REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. T.B.M. 32A is Located at "Top of Outside Bolt End of Guard Rail, S.W. Corner of Bridge No. 37-244 Over Guadalupe River and Mt. View - Alviso Road, X in Bolt and Painted Blue", and Elevation Thereof is 14.75' as of 1971.
2. Contractor Shall Notify P.G.E. 96 Hrs. Before Beginning Work Around P.G.&E. High Pressure Gas Line.
3. Existing Fence and Gate shall be Temporarily Removed to Permit Levee Construction at that Location. Fence and Gate shall be Reinstalled Along Original Alignment after Completion of Levee Construction. Fence Adjacent to State Route 237 shall be Secured at the End of each Working Day.
4. Proposed Soffit Elevation of 237 Westbound Bridge. Bridge raising is not part of this project.

DATE OF PHOTOGRAPHY 5-12-72

DATE Jan. 78
DESIGN B.J.M./J.P.
DRAWN F.S.W.
CHECKED G.T.D.

Santa Clara Valley Water District

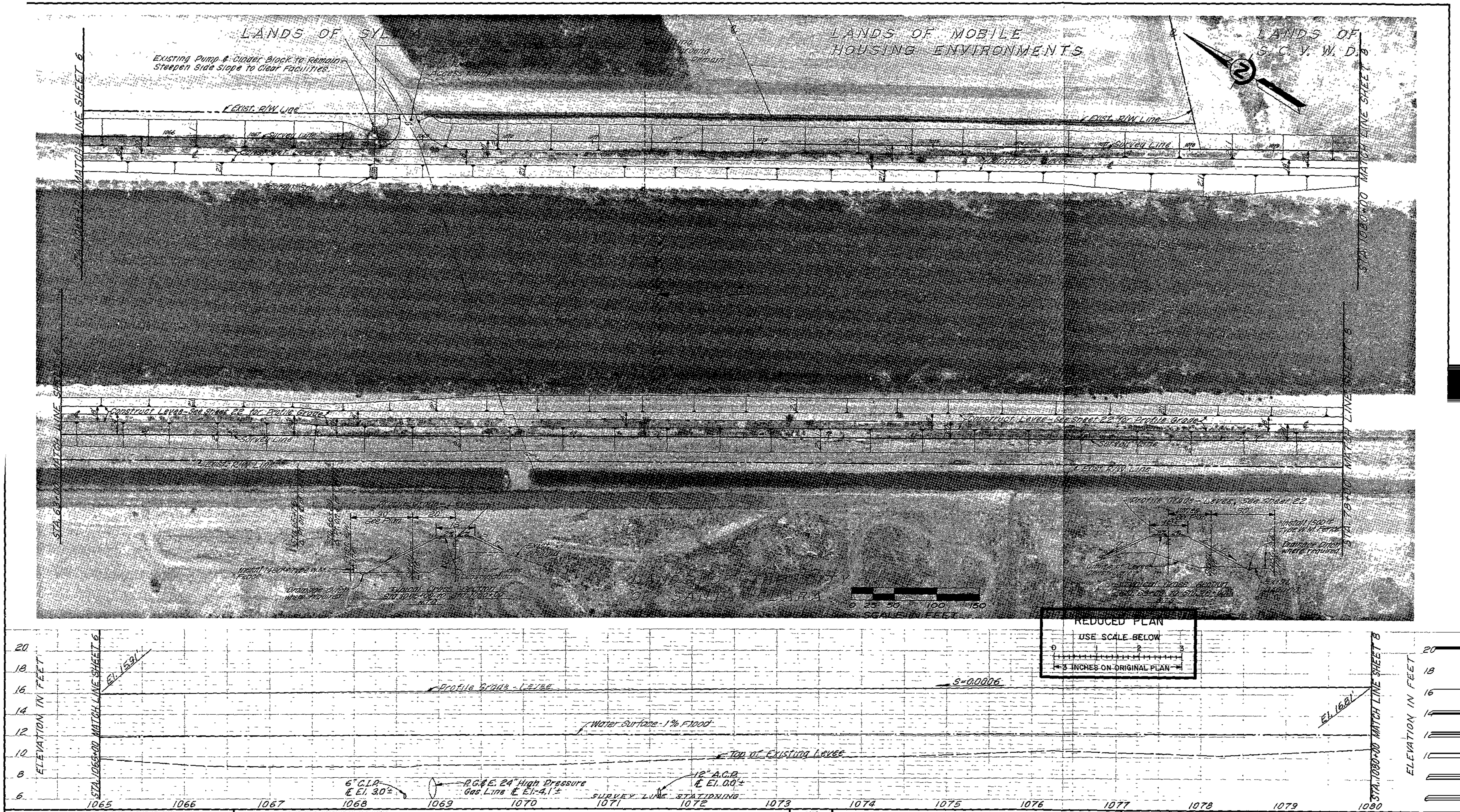
ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22949
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE Hor. 1"=50' Ver. 1"=4'
SHEET 6 OF 24



REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. Contractor shall Notify the P.G.&E. 96 Hours before Beginning Work Around the P.G.&E. High Pressure Gas Line.

DATE Jan. 78
DESIGN BJM/J.P.
DRAWN F.S.W.
CHECKED B.T.O.

Santa Clara Valley Water District

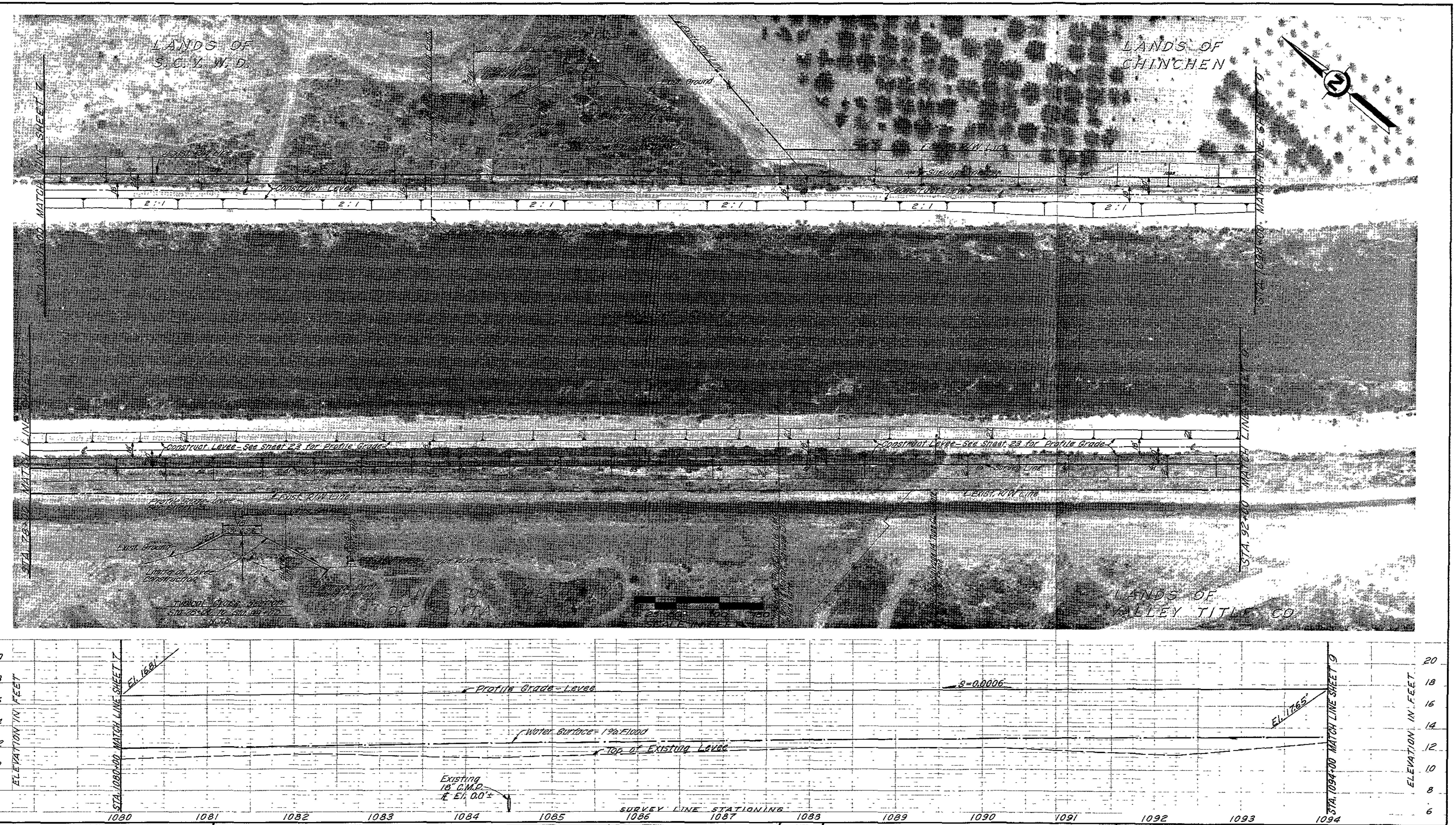
ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 229 B
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO. 14456

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
Hor. 1"=
Ver. 1"=
SHEET 7
OF



REFER TO TRACING FOR LATEST REVISION

DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 5-12-72

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE	Jan. 78
DESIGN	B.J.M./J.R.
DRAWN	F. S. W.
CHECKED	G.T.D.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
PROJECT ENGINEER R.C.E. NO. 22946
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

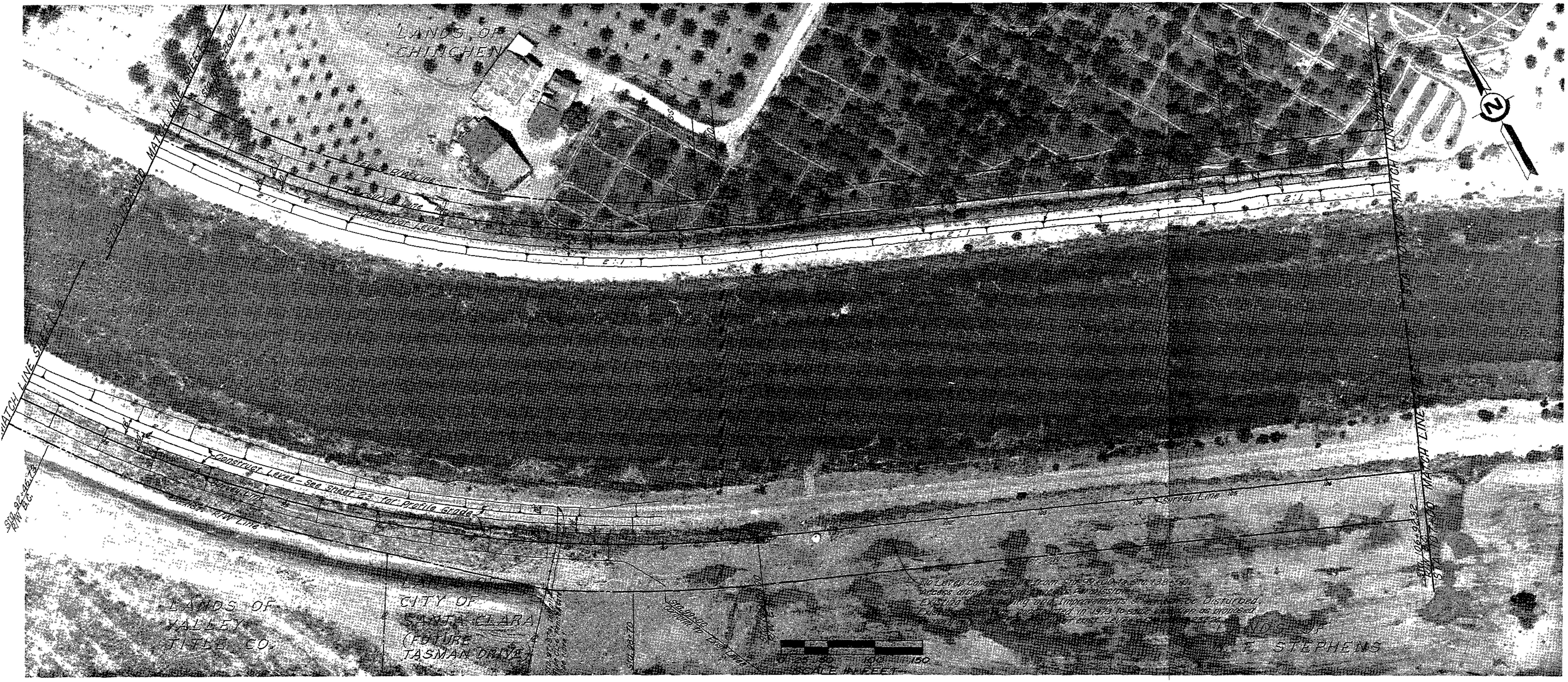
ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

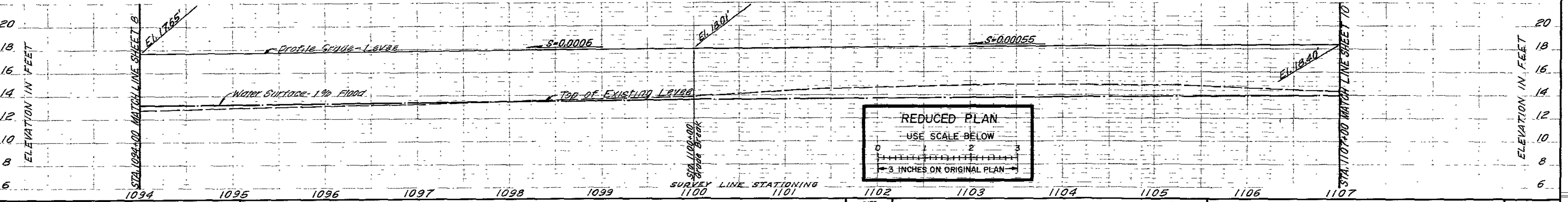
PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
Hor. 1" = 50'
Ver. 1" = 4'

SHEET
8
OF 24


LANDS OF CHINCHEN
MATCH LINE SHEET 8
MATCH LINE SHEET 10
STA. 92+46.73 R/W B.C.
2:1
Construct Levee - See Sheet 22 for Profile Grade
Survey Line
LANDS OF VALLEY TITLE CO.
CITY OF SANTA CLARA (FUTURE TASMAN DRIVE)
No Levee Construction from Sta. 99+00 to Sta. 138+50.
Access along Existing Levee is Permissible.
Existing Landscaping and Improvements shall not be Disturbed.
LANDS OF W. E. STEPHENS
0 25 50 100 150
SCALE IN FEET



REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. Existing Fence and Gate shall be Temporarily Removed to Permit Levee Construction at that Location. Fence and Gate shall be Reinstalled Along Original Alignment after Completion of Levee Construction.

DATE OF PHOTOGRAPHY 7-6-72

DATE	Jan. 78
DESIGN	B.J.M./J.P.
DRAWN	F.S.W.
CHECKED	G.T.O.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22946
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

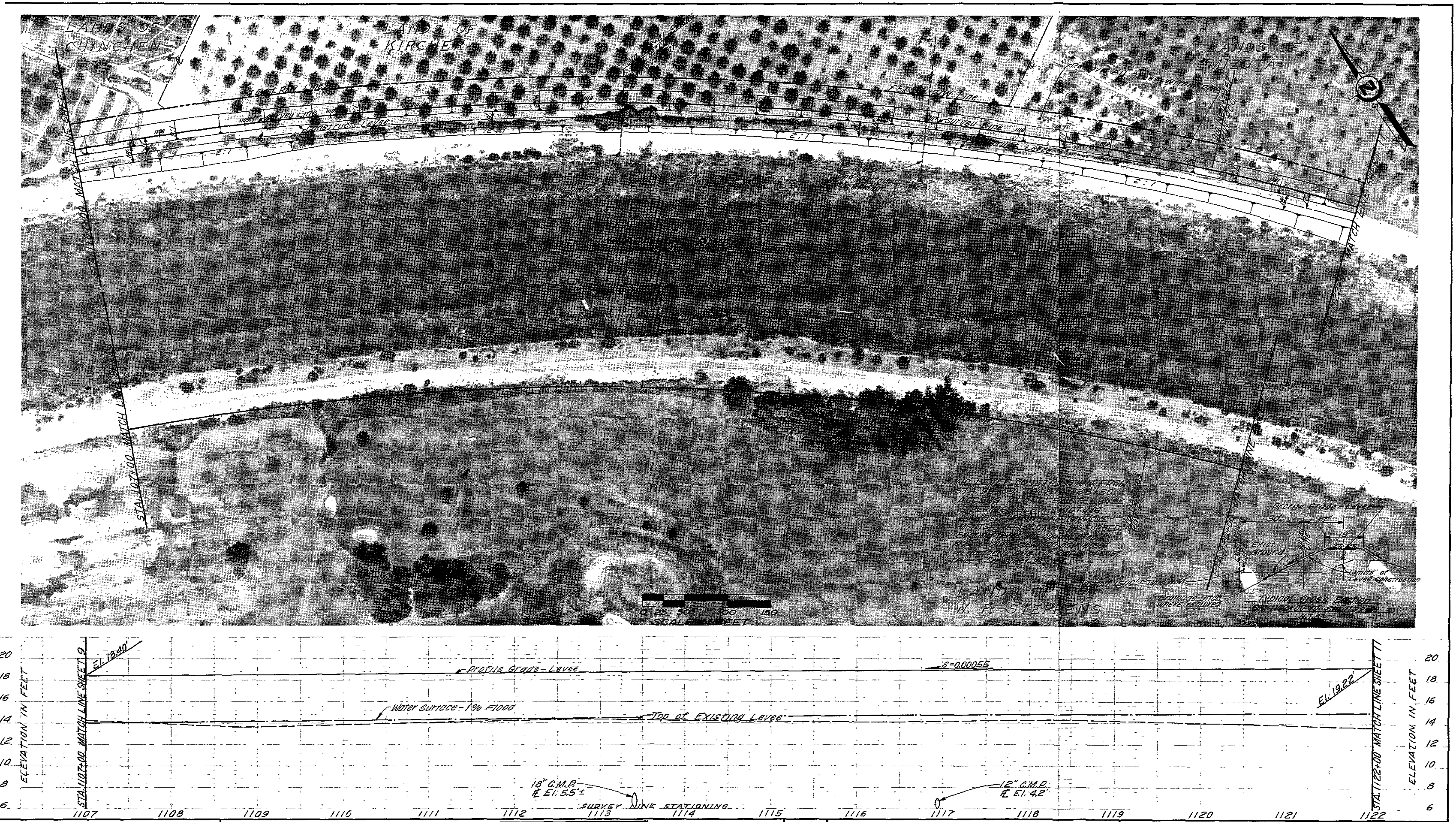
ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE
GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
Hor. 1"=50'
Ver. 1"=4'

SHEET
9
OF 24



REV	DESCRIPTION	SUB	APPR

REFER TO TRACING FOR LATEST REVISION

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 5-12-72

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan. 78
DESIGN B.J.M./J.P.
DRAWN F.S.W.
CHECKED G.T.D.

Santa Clara Valley Water District

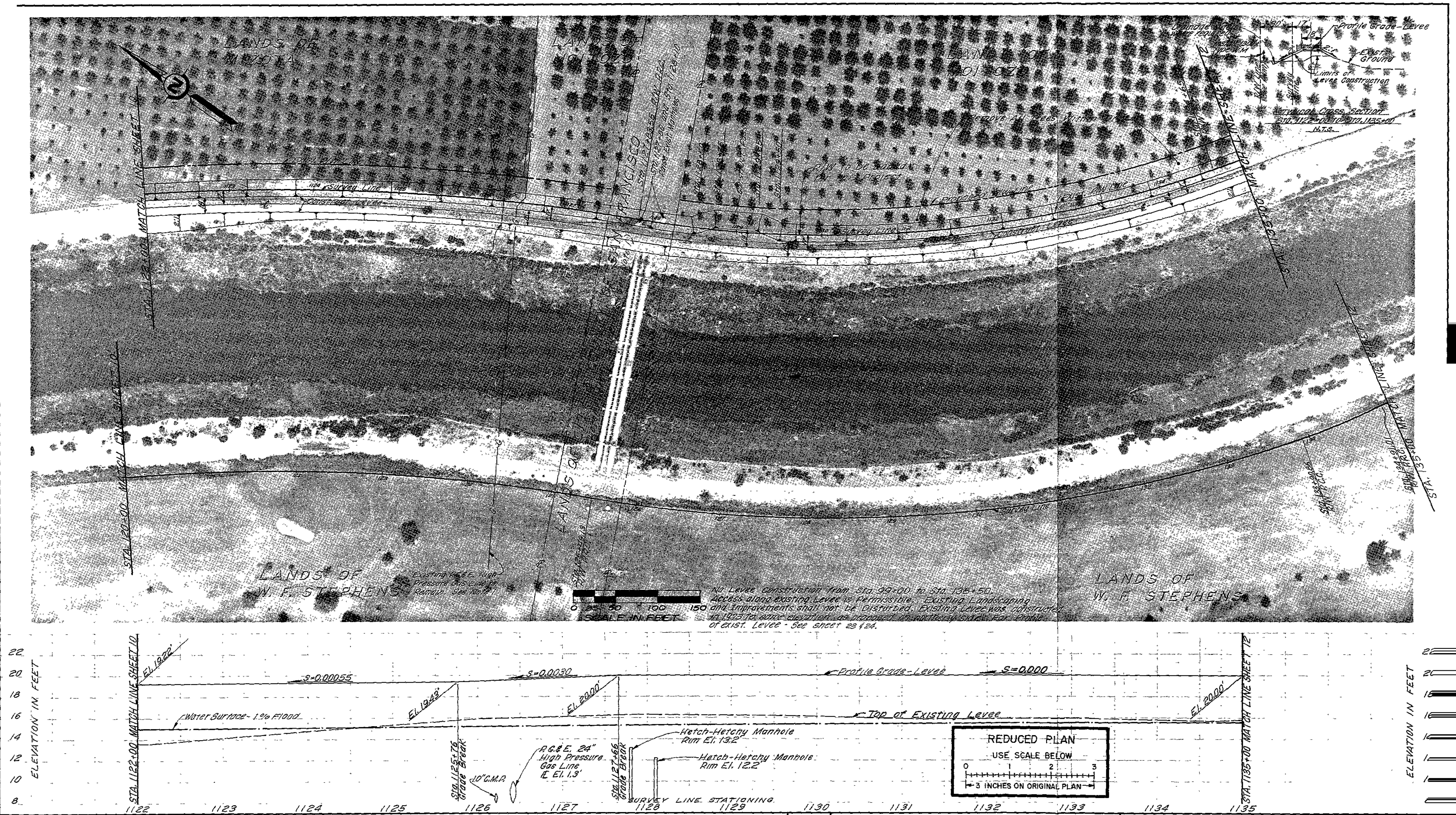
ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE Hor. 1"=50' Ver. 1"=4'
SHEET 10 OF 24



No Levee Construction from Sta. 99+00 to Sta. 138+50. Access along existing Levee is Permissible. Existing Landscaping and Improvements shall not be Disturbed. Existing Levee was constructed in 1973 to same elevation as proposed on northerly side. For Profile of exist. Levee - See sheet 23 & 24.

REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. Contractor shall Notify P.G.&E. 96 Hours before Beginning Work Around the Hetch-Hetchy Pipelines and/or the P.G.&E. High Pressure Gas Line.

DATE Jan. 78
DESIGN B.J.M./U.P.
DRAWN F.S.W.
CHECKED G.T.D.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
B. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22940
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15861

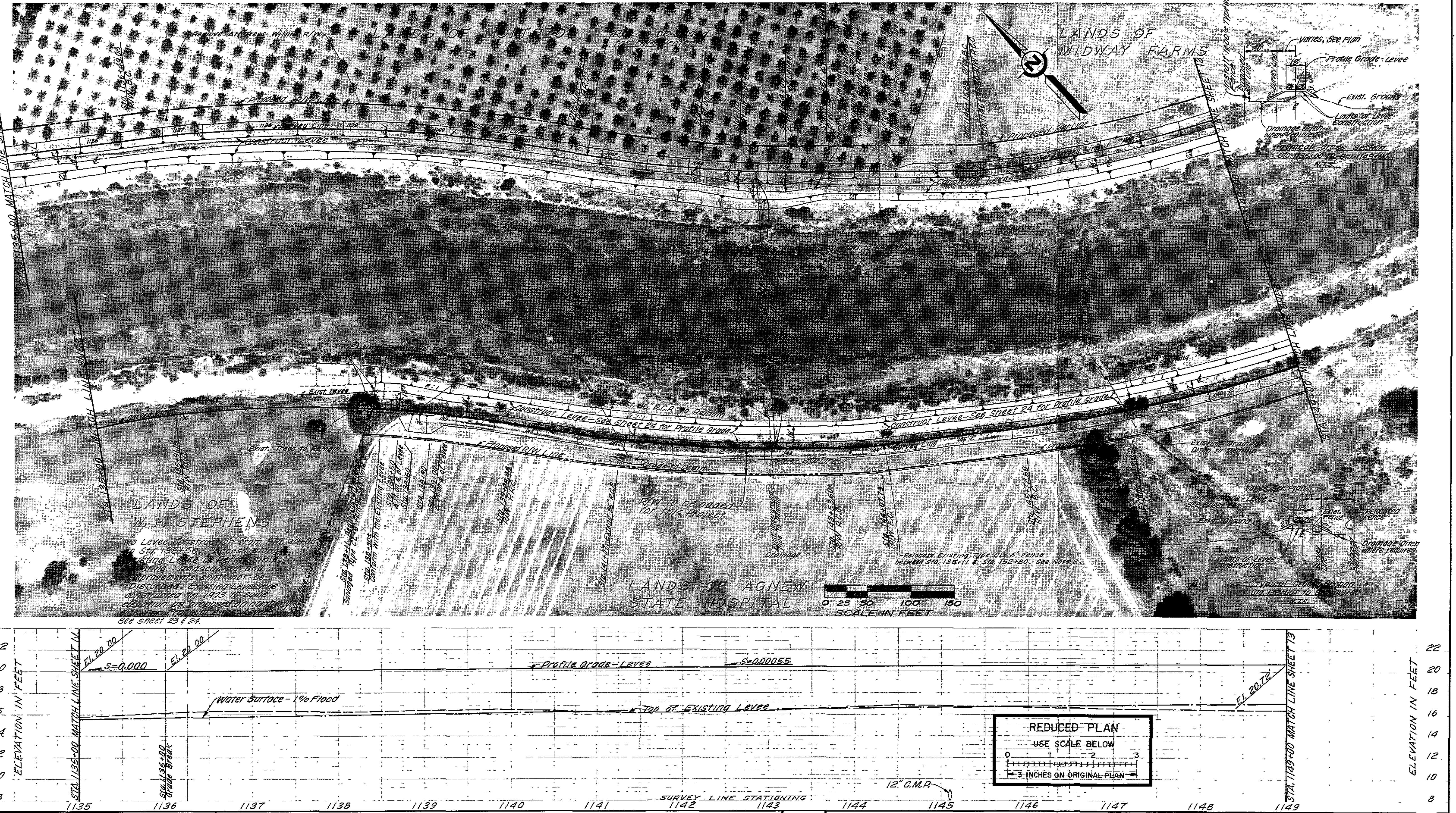
ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD

CENTRAL ZONE

SCALE
Hor. 1"=
Ver. 1"=
SHEET
1
OF


LANDS OF MOTROZO
Remove All Trees Within R/W
Proposed R/W Line
Survey Line
Construct Levee
LANDS OF MIDWAY FARMS
STA. 1135+00 MATCH LINE SHEET 11
STA. 1149+00 MATCH LINE SHEET 13
Varies, See Plan
Profile Grade - Levee
Exist. Ground
Limits of Levee Construction
Drainage Ditch where required
Typical Cross Section
Sta. 1135+00 to Sta. 1149+00
N.T.S.
Exist. Levee
Exist. Trees to Remain
LANDS OF W. F. STEPHENS
No Levee Construction from Sta. 99+00 to Sta. 138+50. Access along Existing Levee is Permissible. Existing Landscaping and Improvements shall not be Disturbed. Existing Levee was constructed in 1973 to same elevation as proposed on northerly side. For Profile of exist. Levee See sheet 23 & 24.
Sta. 138+11 Begin Install of Salvaged Type CL-6' Fence
Sta. 138+30± Conform with the Existing Levee
Sta. 138+50
Sta. 138+90
Sta. 139+00
Sta. 139+98.48 R/W P.R.C.
Sta. 141+07 Extend 36" R.C.P.
Exist. 36" R.C.P. to Remain
Construct Levee - See Sheet 24 for Profile Grade
Proposed R/W Line
Grade to Drain
Exist. R/W Line
R/W to be added for this Project
Exist. Underground Pipe to Remain
Drainage
Sta. 143+53.60 R/W P.C.C.
Sta. 144+07.79 R/W E.C.
Sta. 145+72.59 R/W B.C.
Relocate Existing Type CL-6' Fence between Sta. 138+11 & Sta. 152+80. See Note 2.
LANDS OF AGNEW STATE HOSPITAL
0 25 50 100 150
SCALE IN FEET
Existing Drainage Ditch to Remain
Profile Grade - Levee See Sheet 24
Exist. Fence
Relocated Fence
Typical Cross Section
Sta. 138+00± to Sta. 149+00
N.T.S.
El. 20.00
S=0.000
El. 20.00
Profile Grade - Levee
S=0.00055
Water Surface - 1% Flood
Top of Existing Levee
El. 20.72
STA. 1136+00 Grade Break
ELEVATION IN FEET
22
20
18
16
14
12
10
8
REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN
12" C.M.P.
SURVEY LINE STATIONING
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149

REFER TO TRACING FOR LATEST REVISION			
	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. Contractor shall Notify the P.T.&T. 4 Working Days Before Beginning Work Around the Pacific Telephone and Telegraph Telephone Poles.
2. Type CL-6' Fence shall be Installed 6" Outside (West) of District R/W Line and shall Begin at the Existing East-West Type CL-6' Fence.

DATE OF PHOTOGRAPHY 5-12-72

DATE Jan. 78
DESIGN B.J.M./J.P.
DRAWN F.S.W.
CHECKED G.T.O.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

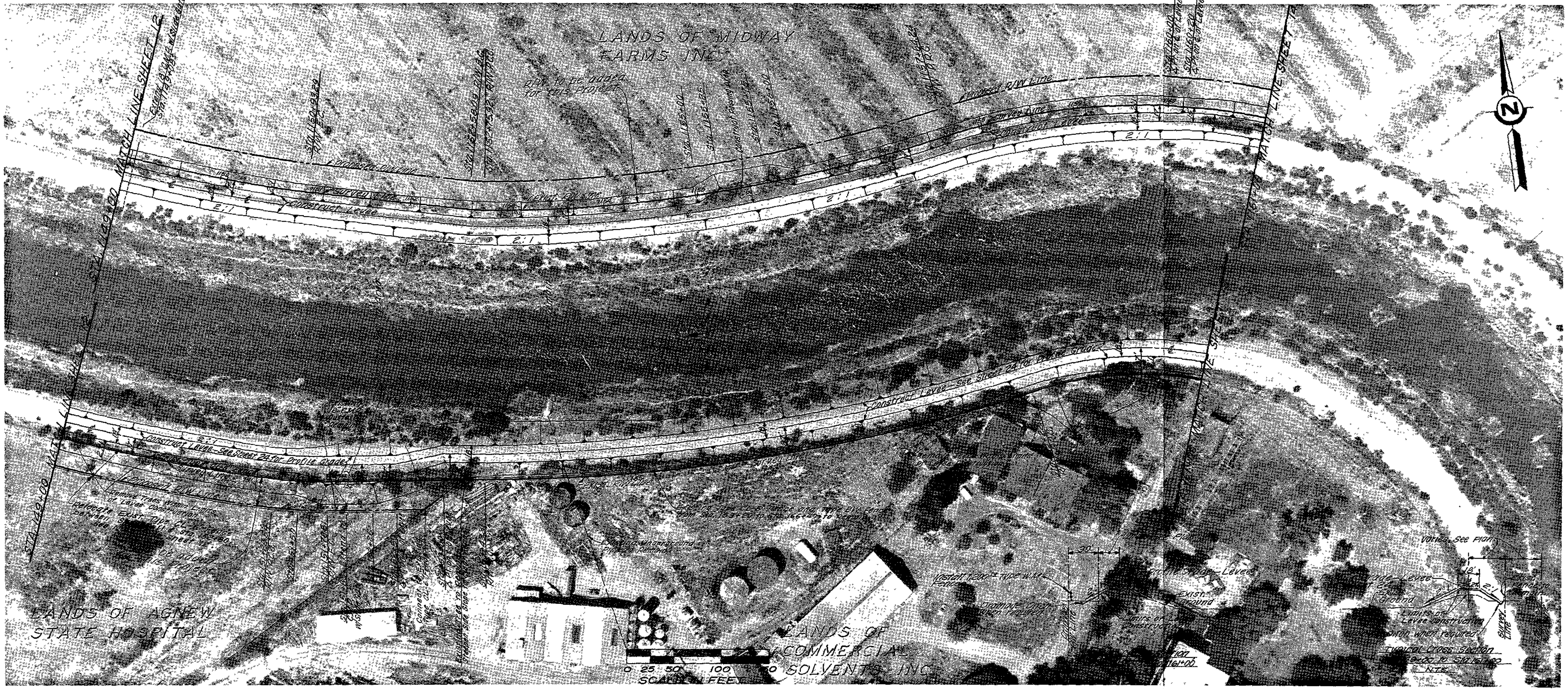
ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO. 14455

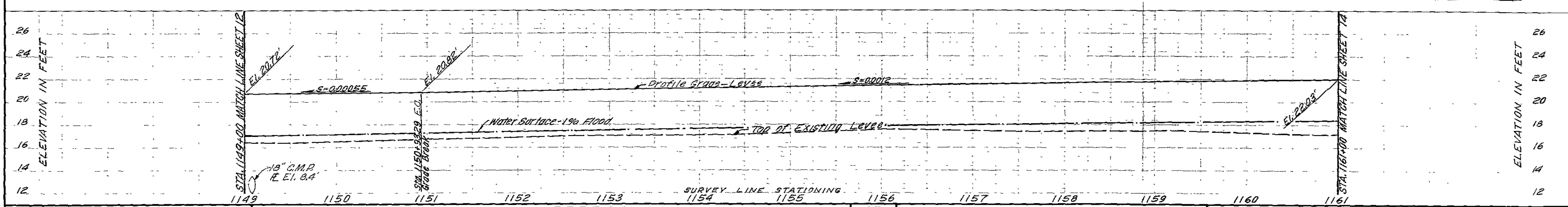
PLAN AND PROFILE
GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
Hor. 1"=50'
Ver. 1"=4'

SHEET
12
OF 24


LANDS OF MIDWAY FARMS INC.
LANDS OF AGNEW STATE HOSPITAL
LANDS OF COMMERCIAL SOLVENTS, INC.
STA. 1149+00 MATCH LINE SHEET 12
STA. 1161+00 MATCH LINE SHEET 14
Extend 18" C.M.P. w/Slide Gate Sta. 1149+08
Sta. 1150+93.29 R/W E.C.
R/W to be added for this Project
Proposed R/W Line
New Survey Line
Construct Levee
Exist. R/W Line
Construct Levee - See Sheet 24 for Profile Grade
Proposed R/W Line
Remove Trees within Limits of Levee Construction
Relocate Exist. Type CL-6 Fence
To be added for this Project
Existing Underground Pipe to be Removed
Connect to Exist. Type CL-6 Fence
Install 1200± Type W.M. Fence
Drainage Ditch when required
Profile Grade - Levees
Exist. Ground
Limits of Construction
Varies, See Plan
Limits of Levee Construction
Survey Line
Typical Cross Section
Sta. 1149+00 to Sta. 1161+00
N.T.S.
30'
18'
2:1
N
0 25 50 100 150
SCALE IN FEET



REFER TO TRACING FOR LATEST REVISION			
REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 5-12-72

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE	Jan. 78
DESIGN	B.J.M./J.P.
DRAWN	F.S.W.
CHECKED	G.T.Q.

Santa Clara Valley Water District

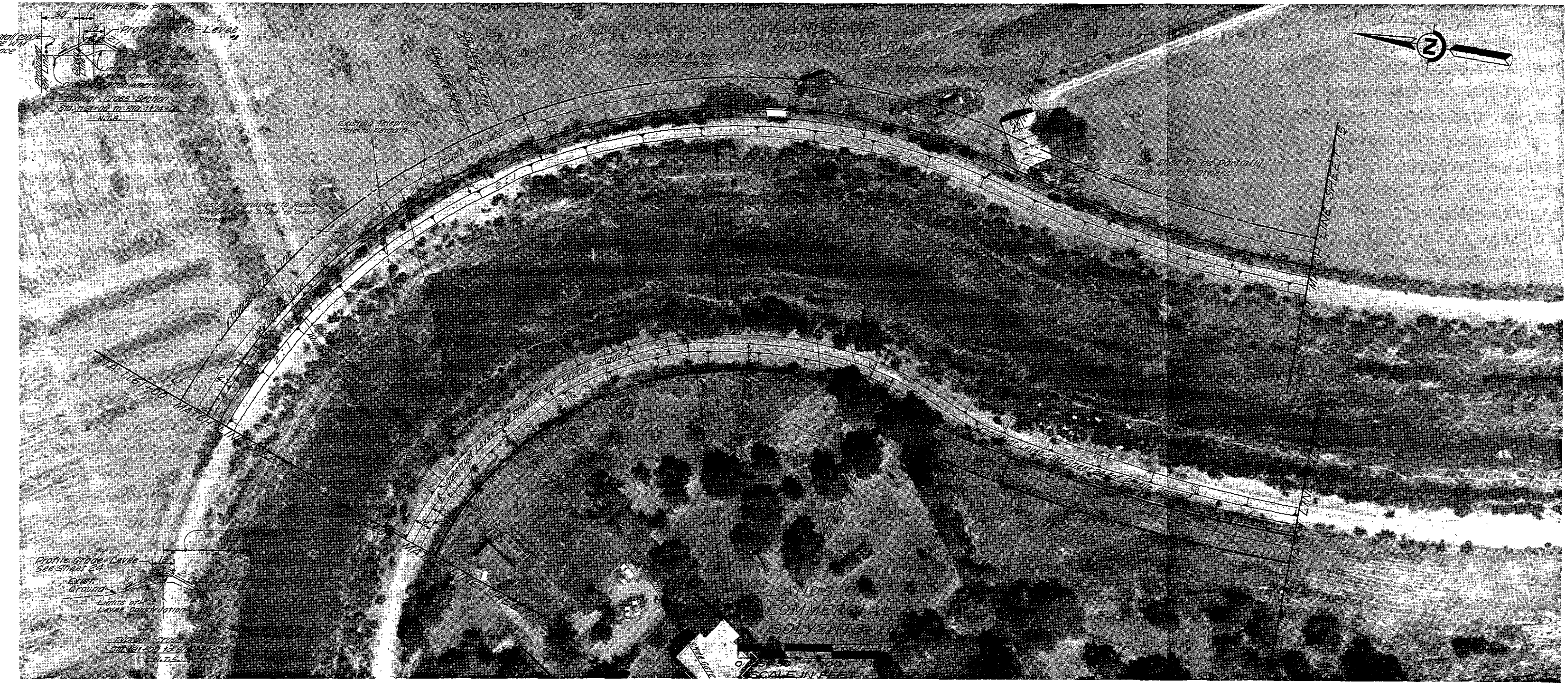
ENGINEERING CERTIFICATION
B. Thomas Dean
PROJECT ENGINEER R.C.E. NO.
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

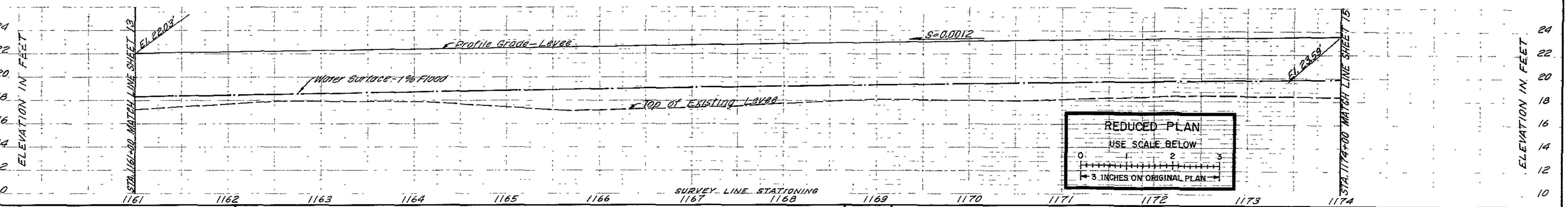
ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
Hor. 1"=5
Ver. 1"=4
SHEET
13
OF 24


Varies See Plan
30'
18'
Profile Grade-Levee
2:1
2:1
Exist. Ground
Limits of Levee Construction
Drainage Ditch where required
Proposed R/W Line
Survey Line
Typical Cross Section
Sta. 1161+00 to Sta. 1174+00
N.T.S.
Existing Telephone Pole to Remain
Exist. R/W Line
Existing Standpipe to Remain Steepen Side Slope to Clear Standpipe
Proposed R/W Line
Survey Line
STA. 1161+00 MATCH LINE SHEET 13
R/W to be added for this Project
Steepen Side Slope to Clear Structures
LANDS OF MIDWAY FARMS
Exist. Buildings to Remain
Exist. Shed to be Partially Removed by Others
Proposed R/W Line
MATCH LINE SHEET 15
Profile Grade-Levee See Sheet 24
Exist. Ground
Limits of Levee Construction
Typical Cross Section
Sta. 1161+00 to Sta. 1174+00
N.T.S.
LANDS OF COMMERCIAL SOLVENTS
SCALE IN FEET



REFER TO TRACING FOR LATEST REVISION

	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1. Contractor shall Notify the P.T.&T. 4 Working Days before Beginning Work around the Pacific Telephone and Telegraph Telephone Poles.

DATE OF PHOTOGRAPHY 5-12-72

DATE Jan. 78
DESIGN B.J.M./J.P.
DRAWN F.S.W.
CHECKED G.T.O.

Santa Clara Valley Water District

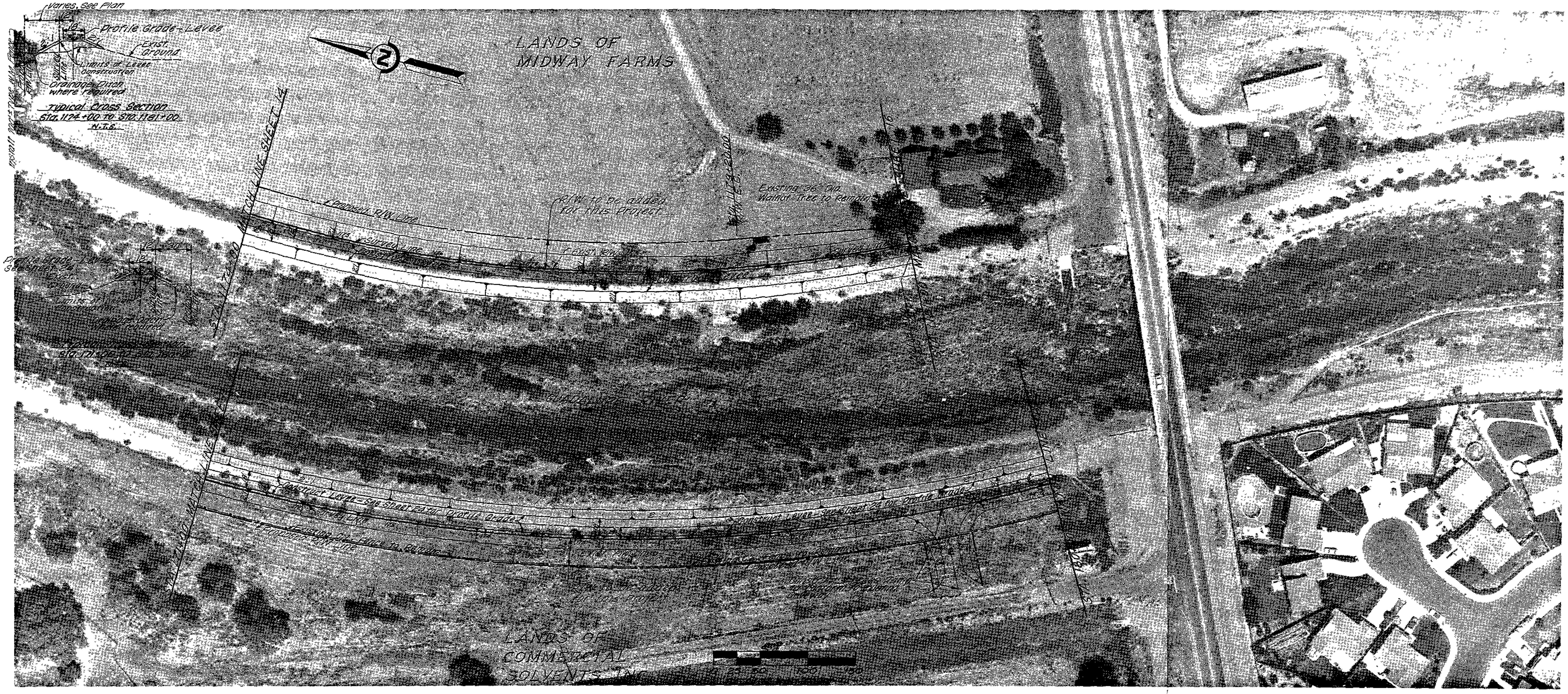
ENGINEERING CERTIFICATION
B. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

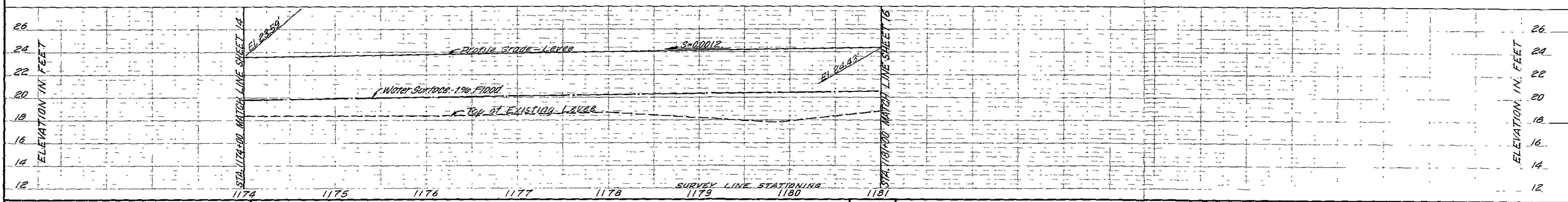
ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE Hor. 1"=50' Ver. 1"=4'
SHEET 14 OF 24


Varies, See Plan
12'
18'
Profile Grade-Levee
2:1
2:1
Exist. Ground
Survey Line
Limits of Levee Construction
Drainage Ditch where required
Install Type W.M. Fence on Line
Typical Cross Section
Sta. 1174+00 to Sta. 1181+00
N.T.S.
N
LANDS OF MIDWAY FARMS
STA. 1174+00 MATCH LINE SHEET 14
Proposed R/W Line
Survey Line
Construct Levee
R/W to be added for this Project
Exist. R/W Line
Existing 36" Dia. Walnut Tree to Remain
Profile Grade-Levee
Construct Levee-See Sheet 24 for Profile Grade
Survey Line
Existing Cyc. Fence to Remain
Proposed R/W Line
Exist. R/W Line
R/W to be added for this Project
2:1
LANDS OF COMMERCIAL SOLVENTS INC.
0 25 50 100 150



REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan. 78
DESIGN B.J.M./J.P.
DRAWN E.S.W.
CHECKED G.T.D.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15051

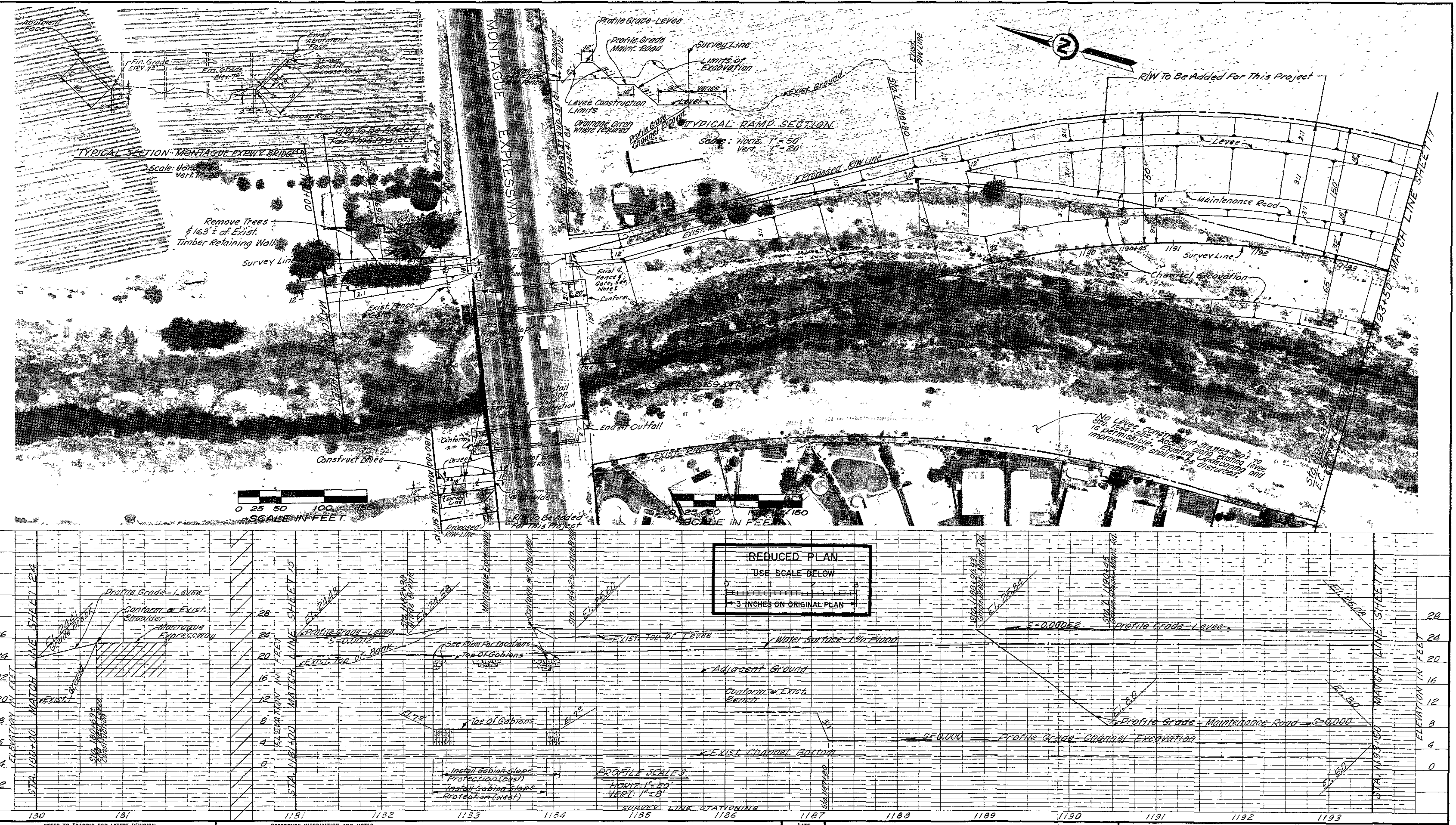
ENGINEERING APPROVAL
Edwin Ferguson
HEAD DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE
Hor. 1"=5
Ver. 1"=4

SHEET
15
OF 24



REFER TO TRACING FOR LATEST REVISION

	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 5-12-72

1. Exist. fences shall be temporarily removed to permit levee construction. Install fence along original alignment after levee construction. Gates shall be centered on the constructed levee.
2. Begin Gabion slope protection at exist. outfall sidewall. Remove exist. sacked concrete along southwall.

DATE Jan 78
DESIGN L.P. & S.B.
DRAWN F.S.W.
CHECKED L.P.

Santa Clara Valley Water District

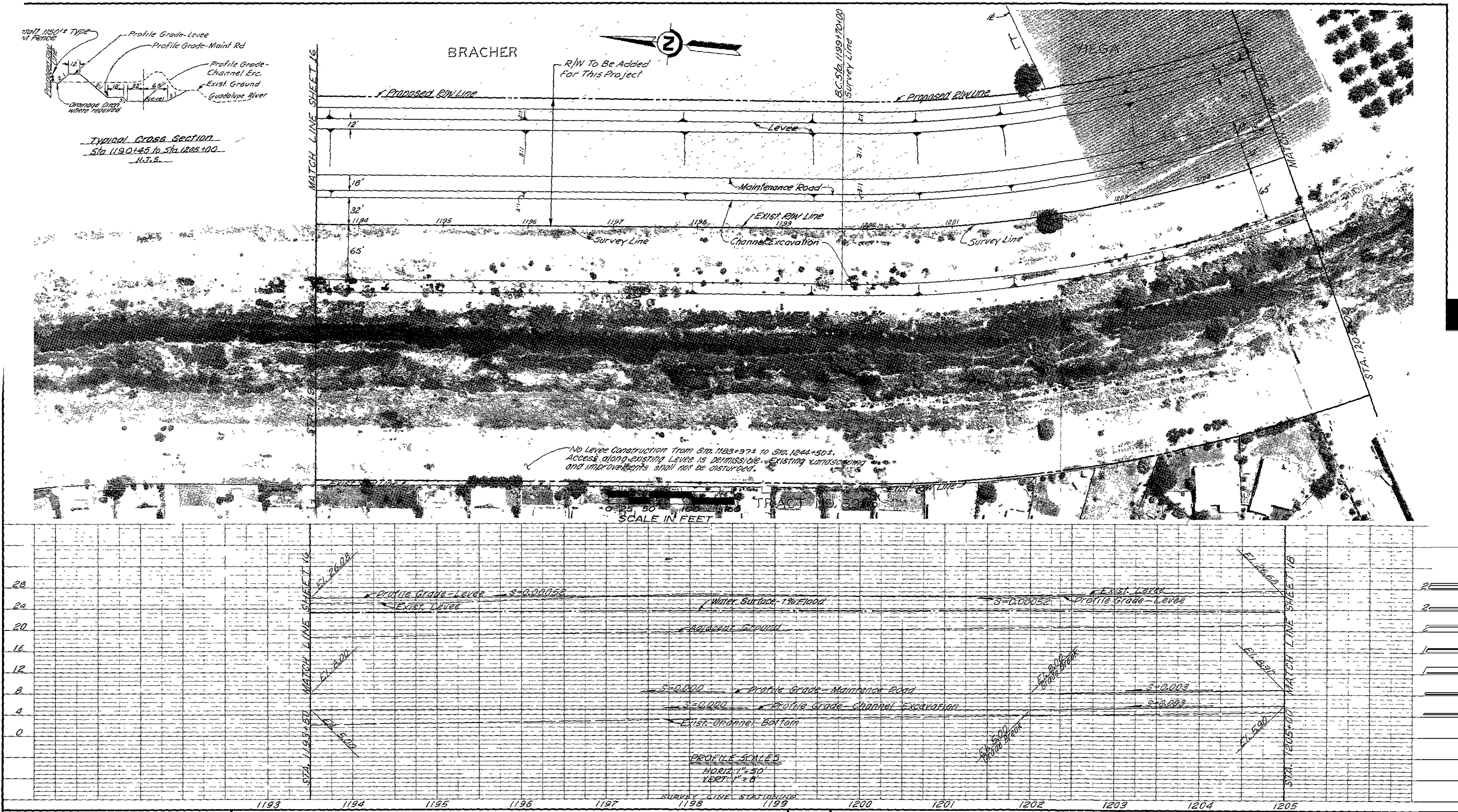
ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO 22908
Bruce Wilson
DIVISION ENGINEER R.C.E. NO 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO 14455

PLAN AND PROFILE GUADALUPE RIVER

SP.R.R TO TRIMBLE ROAD
CENTRAL ZONE

SCALE As Shown
SHEET 16 OF 24



REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1 DATE OF PHOTOGRAPHY 5-12-72

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan 78
DESIGN S.B. & L.P.
DRAWN F.S.W.
CHECKED L.P.

Santa Clara Valley Water District

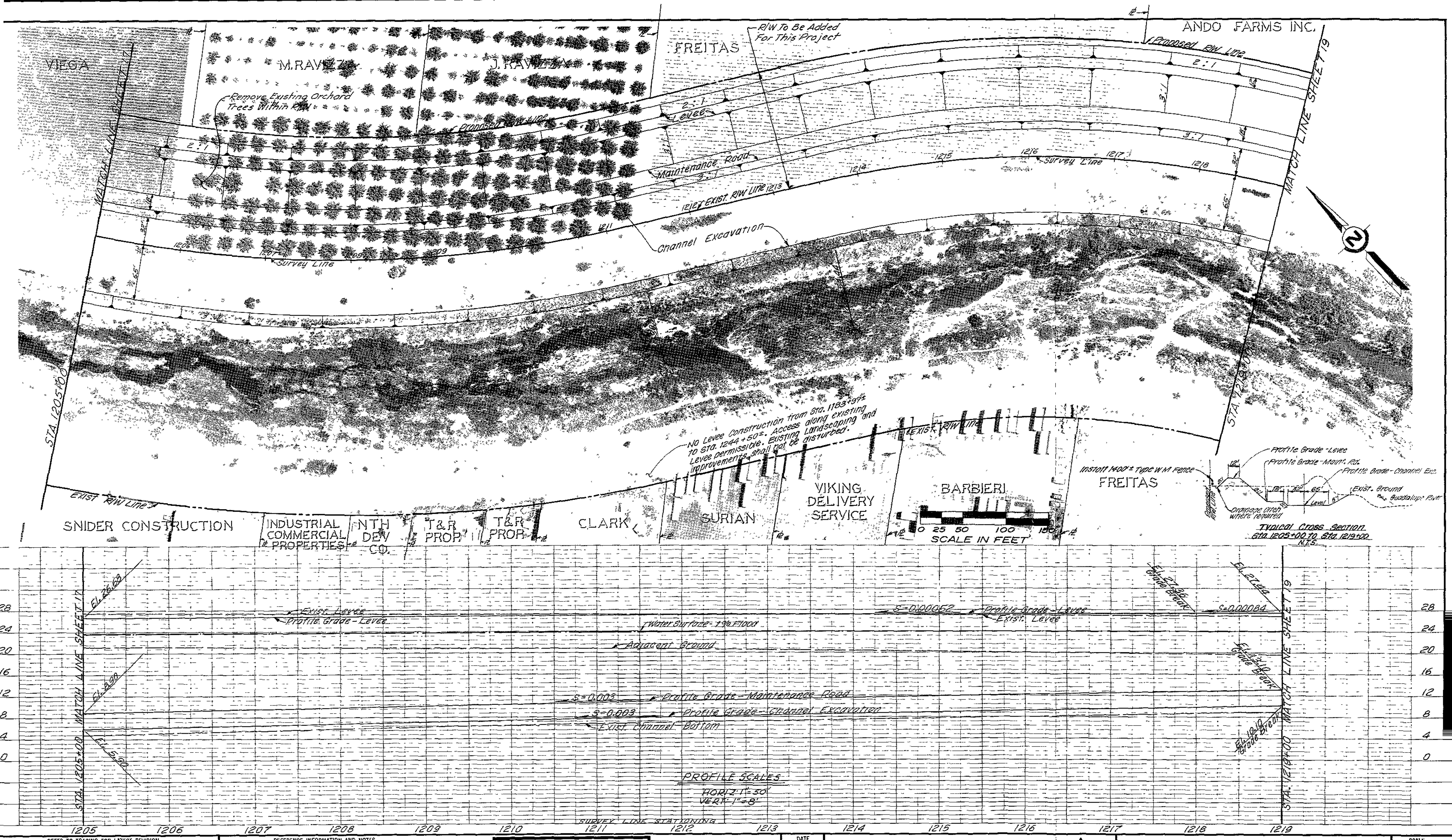
ENGINEERING CERTIFICATION
PROJECT ENGINEER R.C.E. NO. 12048
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE GUADALUPE RIVER

S.P.R.R TO TRIMBLE ROAD
CENTRAL ZONE

SCA
As S
SH



REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1 DATE OF PHOTOGRAPHY 5-12-72

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan. 78
DESIGN S.B. & L.P.
DRAWN F.S.W.
CHECKED L.P.

Santa Clara Valley Water District

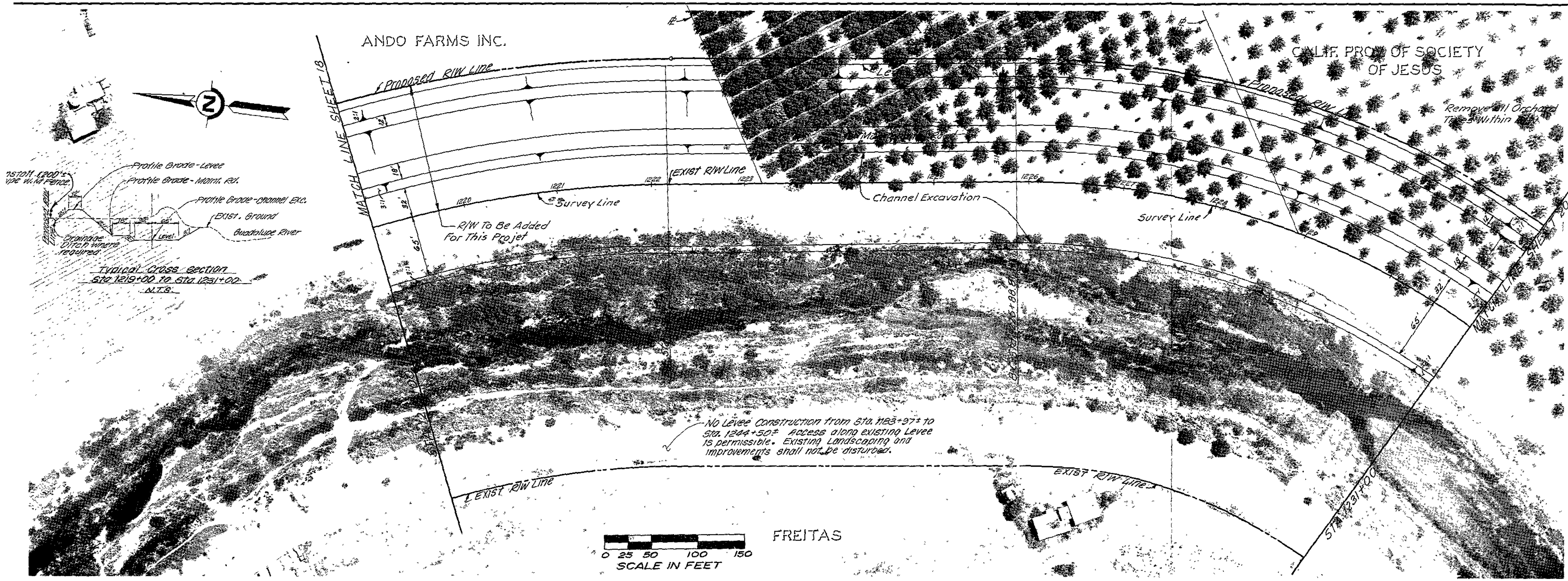
ENGINEERING CERTIFICATION
PROJECT ENGINEER R.C.E. NO 22948
DIVISION ENGINEER R.C.E. NO 15951

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO 14455

PLAN AND PROFILE
GUADALUPE RIVER

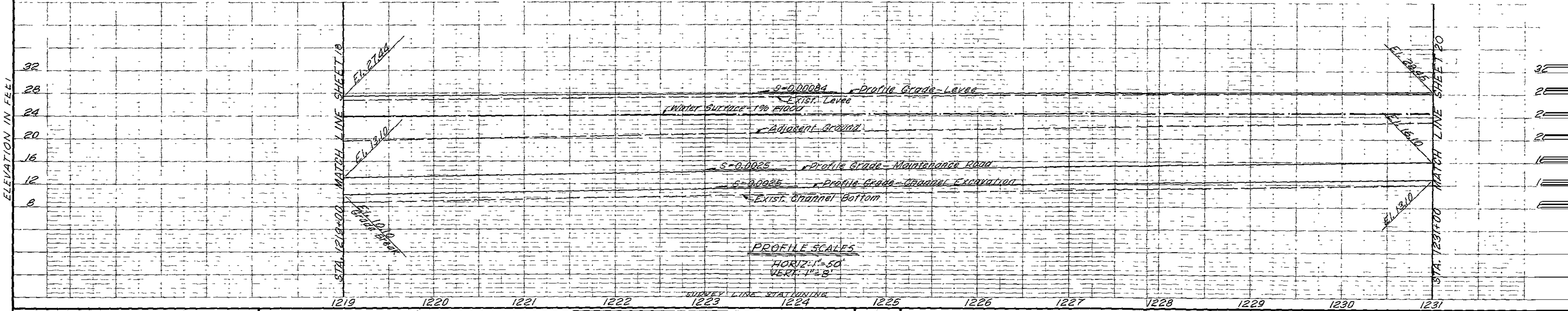
S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE As Shown
SHEET 18 OF 24



Typical Cross Section
Sta 1219+00 to Sta 1231+00
N.T.S.

No Levee Construction from Sta. 1183+97± to Sta. 1244+50± Access along existing Levee is permissible. Existing Landscaping and improvements shall not be disturbed.



PROFILE SCALES
HORIZ: 1"=50'
VERT: 1"=8'

REV	DESCRIPTION	SUB	APPR

REFER TO TRACING FOR LATEST REVISION

REFERENCE INFORMATION AND NOTES
1 DATE OF PHOTOGRAPHY 5-12-72

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan 78
DESIGN L.R.&S.B.
DRAWN F.S.W.
CHECKED L.P.

Santa Clara Valley Water District

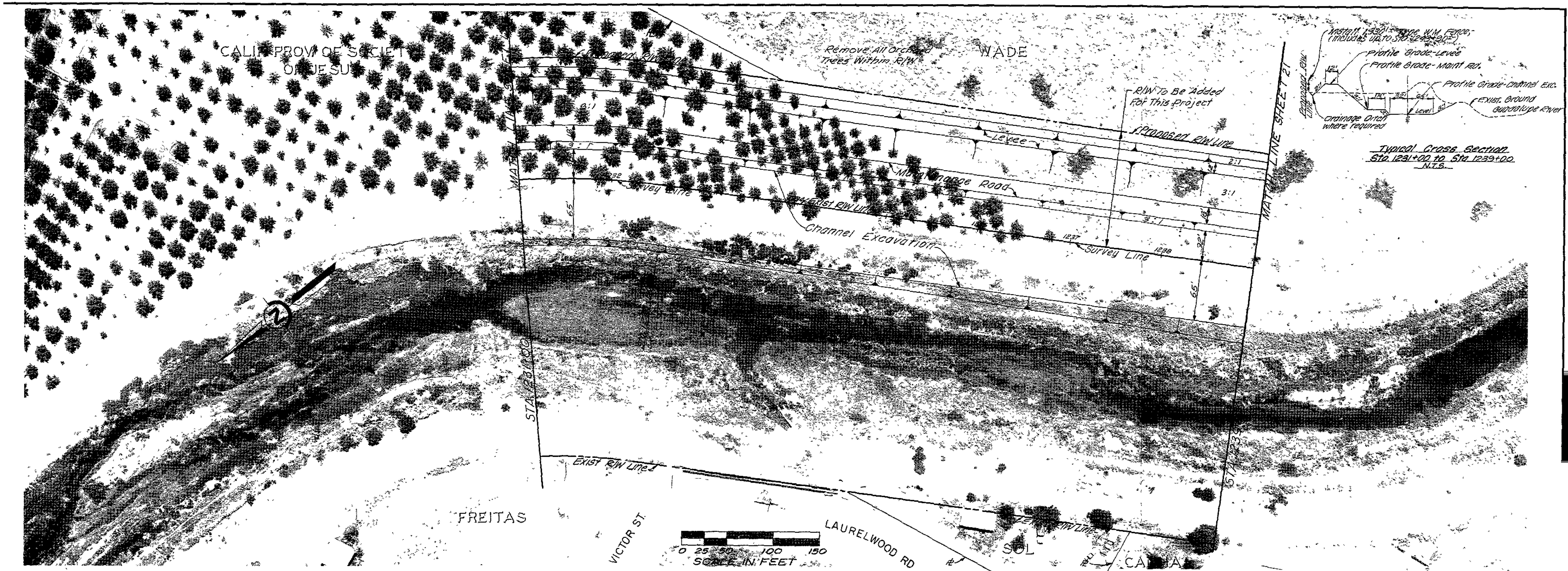
ENGINEERING CERTIFICATION
PROJECT ENGINEER R.C.E. NO.
DESIGN ENGINEER Bruce Welsa R.C.E. NO. 15851

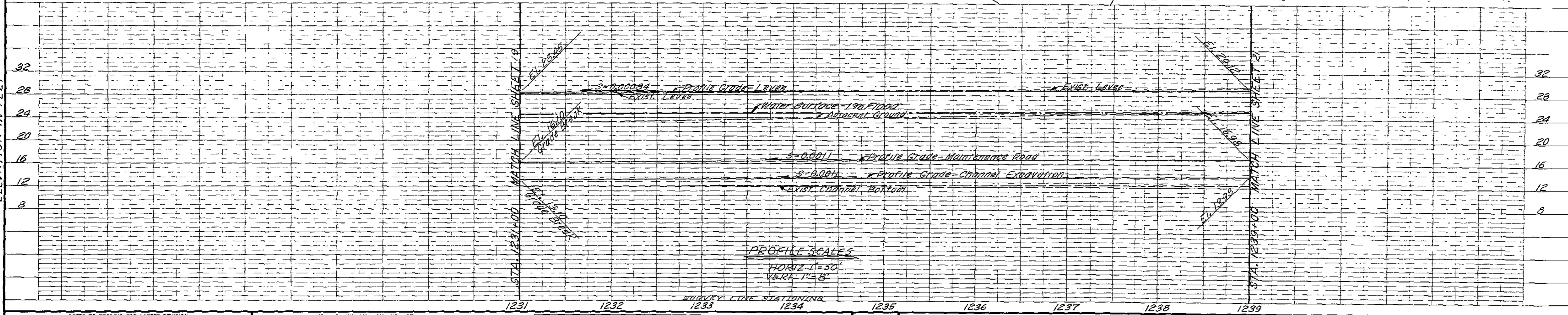
ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE
GUADALUPE RIVER

S.P.R.R. TO TRIMBLE ROAD
CENTRAL ZONE

SCALE As Sh
SHEET 19
OF





REFER TO TRACING FOR LATEST REVISION

REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

1 DATE OF PHOTOGRAPHY 5-12-72

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan 78
DESIGN S.B. & L.P.
DRAWN F.S.W.
CHECKED L.P.

Santa Clara Valley Water District

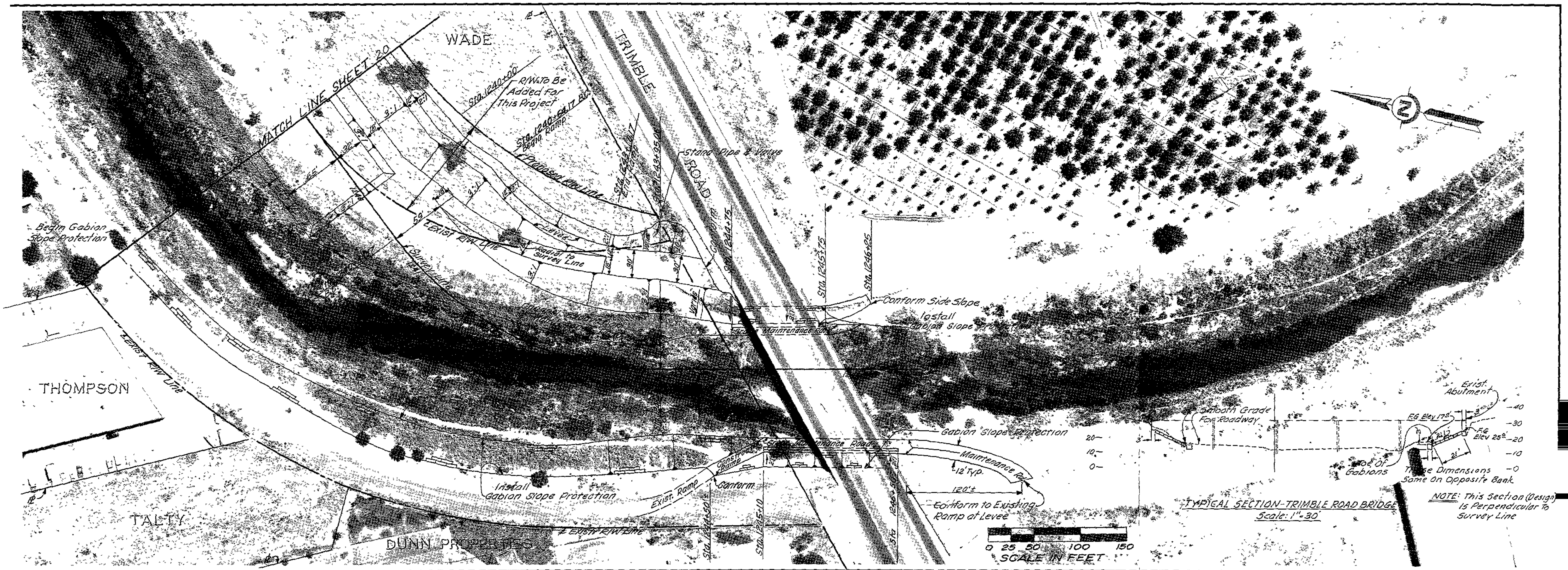
ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

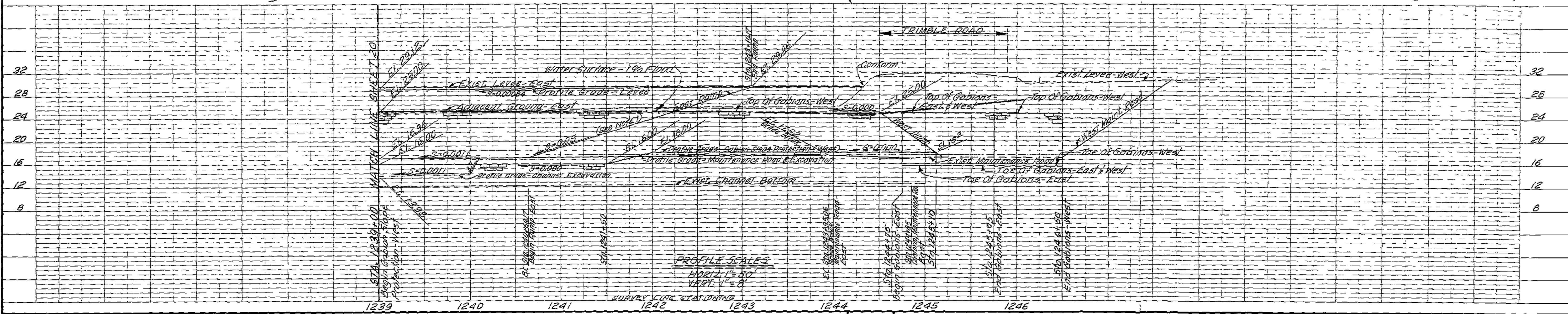
ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

PLAN AND PROFILE
GUADALUPE RIVER

SP.R.R TO TRIMBLE ROAD
CENTRAL ZONE

SCALE As Shown
SHEET 20
OF 24





REFER TO TRACING FOR LATEST REVISION			
REV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

DATE OF PHOTOGRAPHY 5-12-72

1. Ramp Slope is Based on Distances along Survey Line.

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan. 78
DESIGN L.P.
DRAWN F.S.W.
CHECKED L.P.

Santa Clara Valley Water District

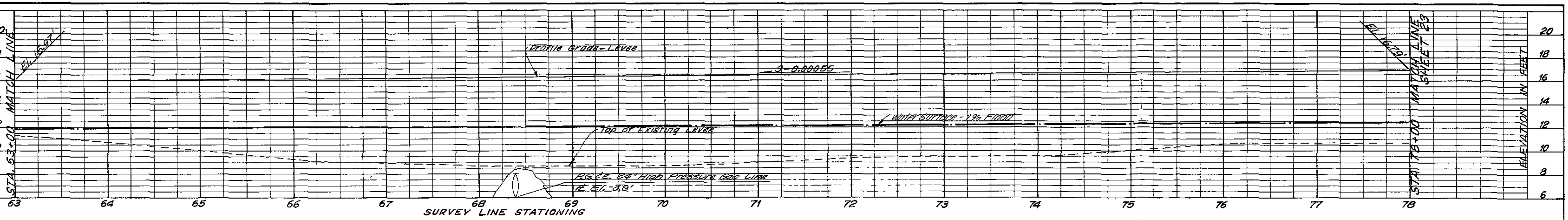
ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO 15651

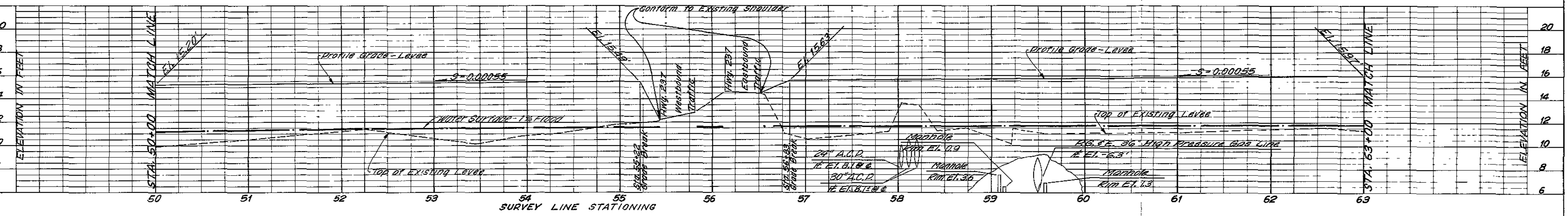
ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO 14455

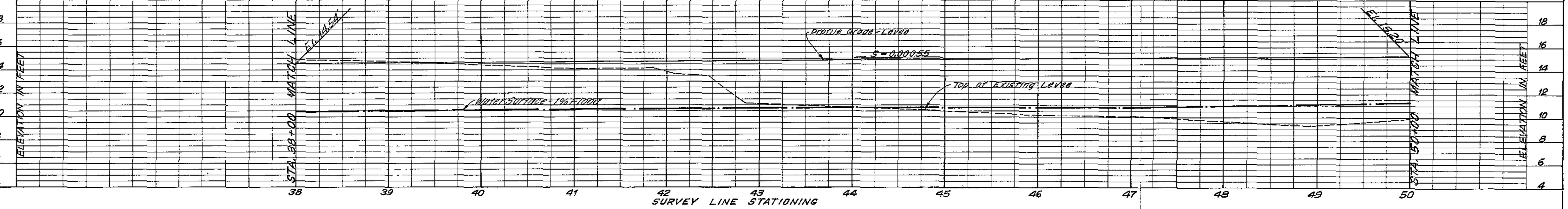
PLAN AND PROFILE GUADALUPE RIVER

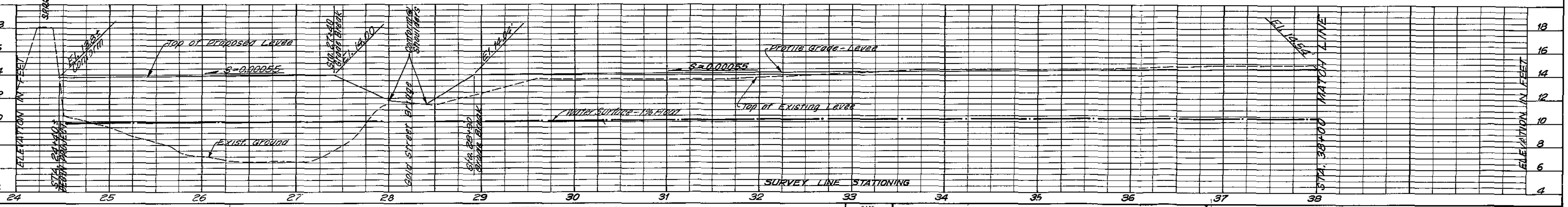
S.P.R.R TO TRIMBLE ROAD
CENTRAL ZONE

SCALE As Sho
SHEET 21
OF 2









REFER TO TRACING FOR LATEST REVISION

DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan. 78
DESIGN J.P.P.
DRAWN F.S.W.
CHECKED G.T.D.

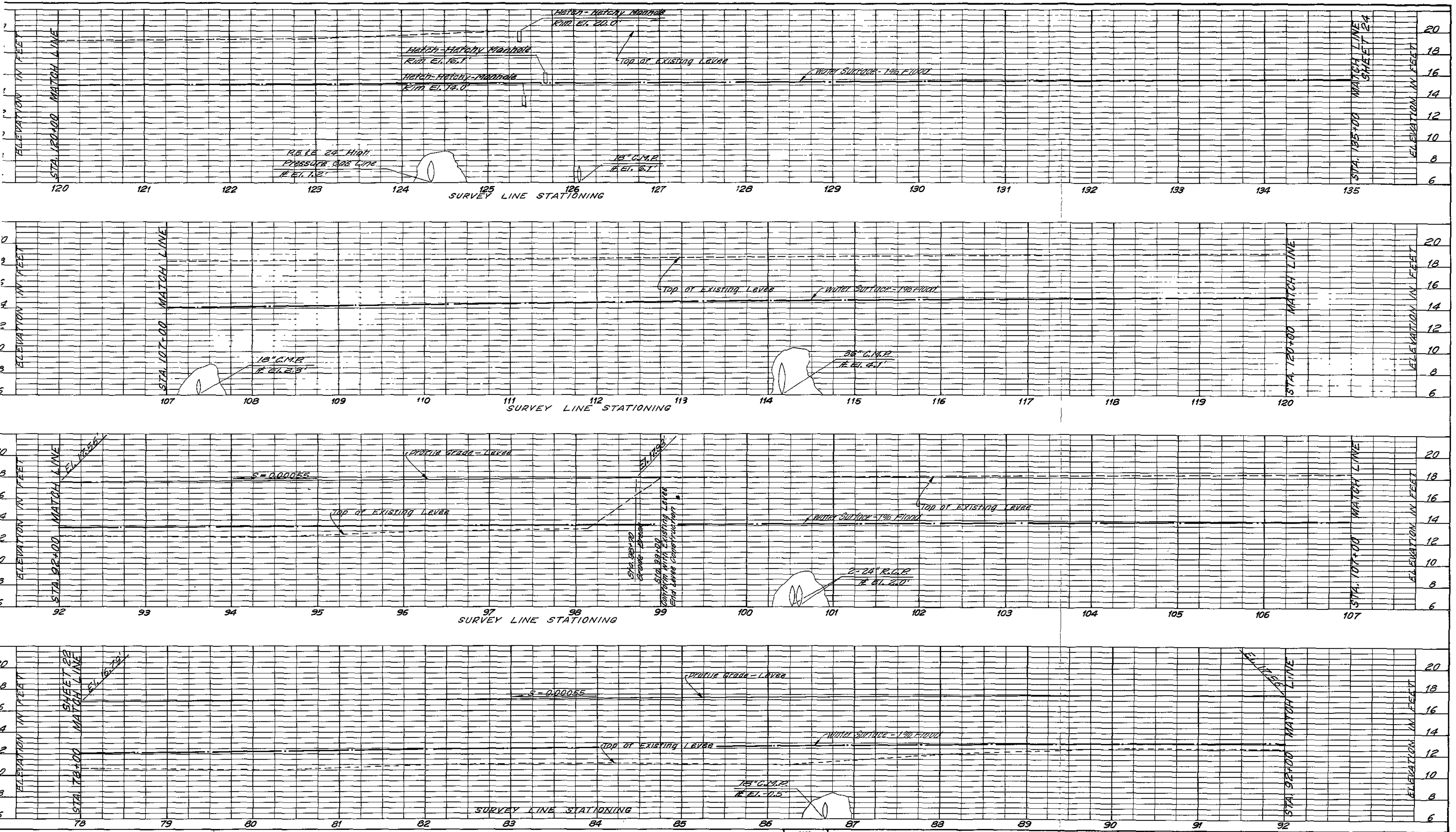
Santa Clara Valley Water District

ENGINEERING CERTIFICATION
B. Thomas Dean
PROJECT ENGINEER R.C.E. NO. 22948
Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

ZONE C-1
GUADALUPE RIVER
PROFILES

SCALE
Hor. 1"=50'
Ver. 1"=4'
SHEET
22
OF 24



REFER TO TRACING FOR LATEST REVISION

DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE Jan. 78
DESIGN J.P.P.
DRAWN F.S.W.
CHECKED B.T.O.

Santa Clara Valley Water District

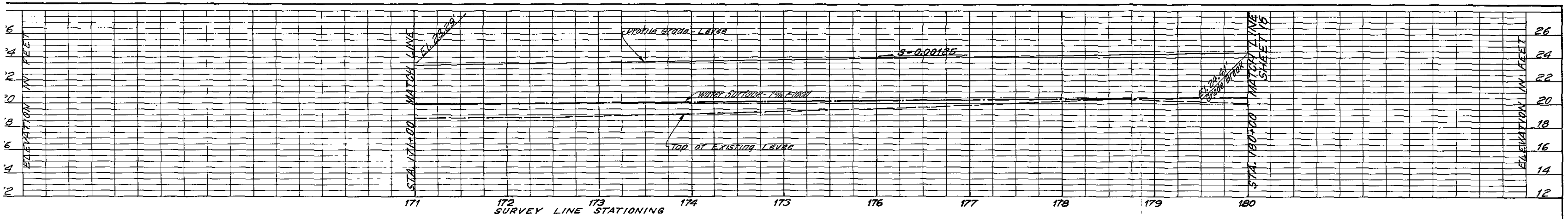
ENGINEERING CERTIFICATION
G. Thomas Dean
PROJECT ENGINEER R.C.E. NO 22948
Bruce Wolea
DIVISION ENGINEER R.C.E. NO 15851

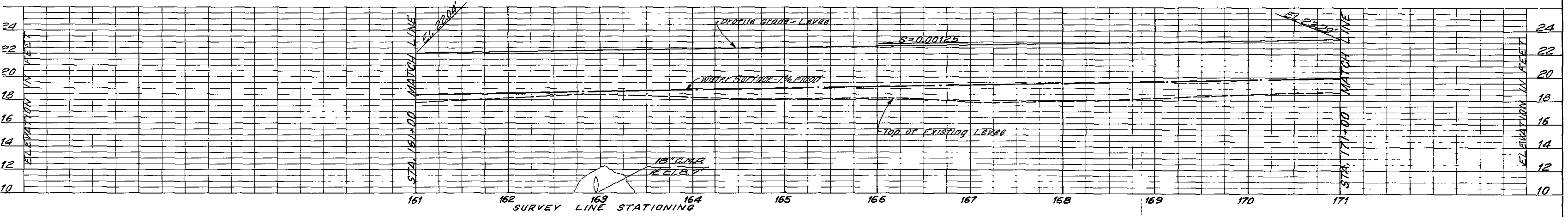
ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO 14435

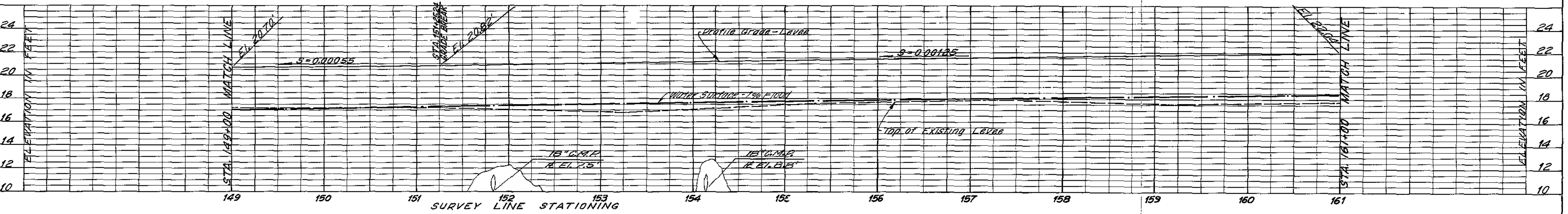
ZONE C-1
GUADALUPE RIVER
PROFILES

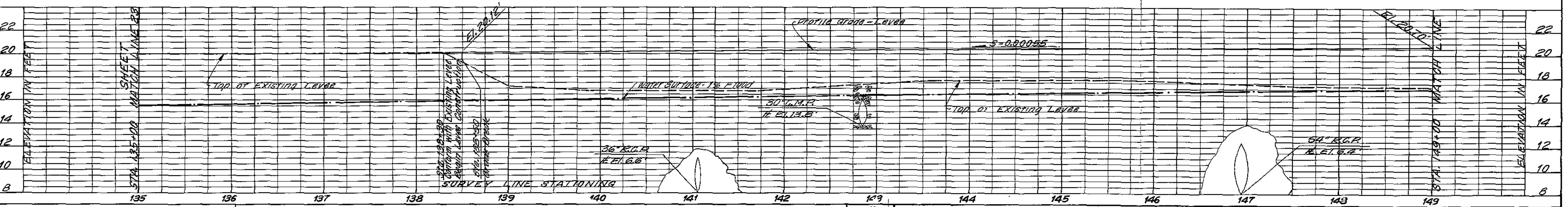
SCALE
Hor. 1" = 50'
Ver. 1" = 4'

SHEET
23
OF 24









REFER TO TRACING FOR LATEST REVISION			
EV	DESCRIPTION	SUB	APPR

REFERENCE INFORMATION AND NOTES

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

DATE
Jan. 78
DESIGN
J.P.P.
DRAWN
F.S.W.
CHECKED
G.T.O.

Santa Clara Valley Water District

ENGINEERING CERTIFICATION
B. Thomas Dean
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Bruce Wilson
DIVISION ENGINEER R.C.E. NO. 15851

ENGINEERING APPROVAL
Edwin Ferguson
HEAD, DESIGN BRANCH R.C.E. NO. 14455

ZONE C-1
GUADALUPE RIVER
PROFILES

SCALE
Hor. 1" = 50'
Ver. 1" = 4'
SHEET
24
OF 24